

# FLIGHT

The  
AIRCRAFT  
ENGINEER  
&  
AIRSHIPS

First Aero Weekly in the World

Founder and Editor: STANLEY SPOONER

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport

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## Flight

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## DIARY OF FORTHCOMING EVENTS

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in the following list:—

1926		
Mar. 4	....	Maj. G. H. Scott. "Development of Airship Mooring," before R.Ae.S.
Mar. 9	....	Mr. O. E. Simmonds, M.A., A.F.R.Ae.S., M.I.Ae.E. "The Development of Civil Marine Aircraft," before Inst.Ae.E.
Mar. 18	....	Mr. A. J. Cobham. "Long-Distance Aeroplane Flights," before R.Ae.S.
Mar. 22	....	Entries close for Gordon Bennett Race.
Mar. 31	....	Entries close for Schneider Cup Race.
Mar. 31	....	Royal Aero Club Annual General Meeting.
April 8	....	Lecture by Marchese de Pinedo, before R.Ae.S.
April 13	....	Mr. S. H. Evans, A.F.R.Ae.S., M.I.Ae.E. "The Performance of Modern Aircraft—with special reference to the Variable Wing," before Inst.Ae.E.
April 15	....	Capt. G. T. R. Hill. "The Tailless Aeroplane," before R.Ae.S.
April 21	....	Inst.Ae.E. visit to Messrs. D. Napier and Son, Acton.
April 29	....	Lieut.-Col. V. C. Richmond. "Results of Recent Airship Flight Tests," before R.Ae.S.

## EDITORIAL COMMENT.



### The Air Debate

SO far it is to be feared that the Debate on the Air Estimates in the House of Commons has not produced very much that was new, nor does there appear to be any likelihood of the unsatisfactory position as regards air defence being improved to any extent during the coming financial year. Generally speaking, however, the House appeared dissatisfied with the Estimates, and that may be taken as a healthy sign. It is true that this spirit of dissatisfaction took various forms, and not by any means were all of them based upon the view that the slowing-down of development is a mistake. There was quite a volume of opinion which considered that the halfway measures taken will merely result in spending a good deal of money without securing in return any adequate guarantee of safety in the air. To that extent, therefore, FLIGHT can agree with the Opposition, even if the processes of reasoning have been very dissimilar. As we pointed out not long ago, to insure a house for very much less than it is worth is a waste of money.

A few points from the day's proceedings appear to stand out clearly. One was the "snub" which Mr. Baldwin gave those who would once more attempt to raise the old controversy about separate air services. The Premier's "hint" was plain to the point of bluntness. The Government does not intend to waste any more time in going over a subject which has already been thoroughly thrashed out, and as Mr. Baldwin indicated, it is now in the interests of all three services that this lamentable controversy should cease. Among a superfluity of wordy encounters, this statement, at any rate, stands out clear and unmistakable for every one to read and—let us hope—heed.

Another fact that was brought out by the first stage of the Air Debate was the growing feeling that sooner or later we shall have to come to that Ministry of Defence about which so much has been said and written. Whether or not the time is ripe for such a change may, perhaps, be open to argument, but

that it will have to be made at some future date is no longer to be doubted. In the meantime, the suggestion made by Sir Frederick Sykes that a joint executive General Staff may be the solution appears worthy of very serious attention. As Sir Frederick pointed out, the Committee of Imperial Defence has done excellent work in the past, but what is required is a body with executive powers, otherwise we shall merely get good advice but have nobody to see to it that that advice is followed and put into operation.

Captain Guest referred to the subject of continuity of policy, and pointed out that until that was assured there was no hope for a solution of the problems before us. As an instance, he mentioned the days of the Geddes Committee, when the Air Force was whittled down to almost nothing, and then, within six months of that time, the present programme of creating 25 to 30 squadrons for Home Defence was adopted. As Captain Guest put it, a policy is needed which will outlast the precarious life of any one Parliament, a point which FLIGHT years ago advocated, *and it must be consistently pursued*. The present Government has laid down such a policy, but in the present Air Estimates it has failed to follow that policy. The uncertainty is extremely harmful in many ways. It is harmful on the Service side, because until there is some assurance that the Air Service is a permanent and expanding service, parents will necessarily hesitate to let their sons join it, with consequent ill effect on the whole spirit of the Air Force.

Technically the effect of an absence of a clearly-defined and continued policy is, perhaps, even more harmful. Progress in aircraft design is still so rapid that a great deal of research is needed to keep pace with the time. When we say research, we mean practical experimentation, mainly in the matter of constructional problems. Aerodynamic data available at the present time are so vast that the difficulty with which the designer is confronted is not so much that of obtaining fresh information but rather how to gather up and make use of such information as already exists in considerable abundance. On structural problems, however, a good deal remains to be done, and it is obvious that if our aircraft construction firms

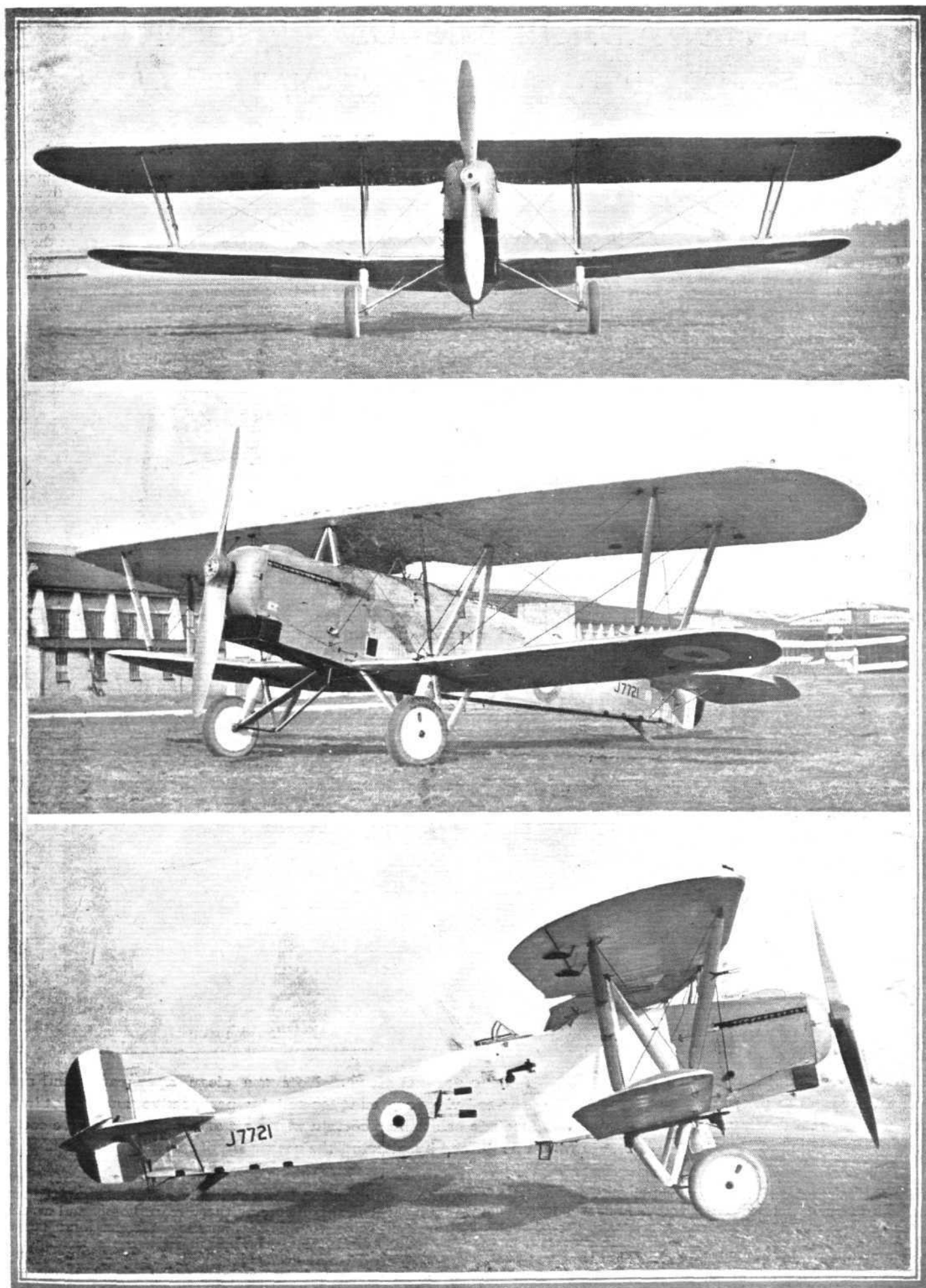
have no sort of assurance of a continuity of policy, they cannot be expected to risk the financial expenditure necessary for such development work. Rear-Admiral Sueter called attention to this fact during the Debate, and pleaded for as much support as it was possible to give to the aircraft industry, even to the extent of cutting out some of the work at Farnborough and giving it to the industry.

It was, of course, inevitable that some mistaken faddist should get up in the House and plead for the exclusive construction of aircraft in Government establishments. This year the old bogey was raised by Mr. Charleton, who wanted to know why they should not make aeroplanes themselves. Why should they put them out to private firms, who made profits on them? Evidently Mr. Charleton has not taken the trouble to study even elementarily the past history of the Royal Aircraft Establishment, or Royal Aircraft Factory, as it originally was. Other people long before him had the same idea, that it would be cheaper to build aircraft in Government factories, where "the best brains of the country" could be collected together. This system was tried, with the result (which might have been expected) that not only did the aeroplanes produced at "The Factory" cost very much more than privately-constructed machines, but that the machines produced had an inferior performance. That system was short-lived, and definitely proved the fallacy of the argument which Mr. Charleton now, in his ignorance, wishes to revive.

A very important point was raised by Brigadier-General Warner, who drew attention to the hold which foreign aircraft firms were getting in the Dominions, notably in South Africa, where a subsidy of £8,000 is to be paid to a German concern. He suggested that the Air Minister should endeavour to summon a conference of representatives from the various Dominions so that the question of aviation might be discussed and an effort be made to secure that when those countries placed their orders they should place them in this country. He referred to the fact that the German companies were subsidised, and pleaded for support for our own manufacturers to enable them to oppose the foreign competition, an eminently sound and fair plea.



The Bristol "Berkeley" is a Day-Bomber with Rolls-Royce "Condor" Engine. The machine is built entirely of metal, with novel forms of steel construction for main members and Duralumin for minor parts.



[“FLIGHT” Photographs]

**A MODERN DAY-BOMBER :** The Hawker “Horsley” is fitted with a Rolls-Royce “Condor” Engine of 650 h.p. The machine, it will be seen, is of very “clean” design, and is characterised by a bottom plane considerably smaller in span and chord than the top plane. The cowling around the engine is particularly neat.  
(See also pages 128 and 129.)



# THE A.D.C. "NIMBUS" ENGINE

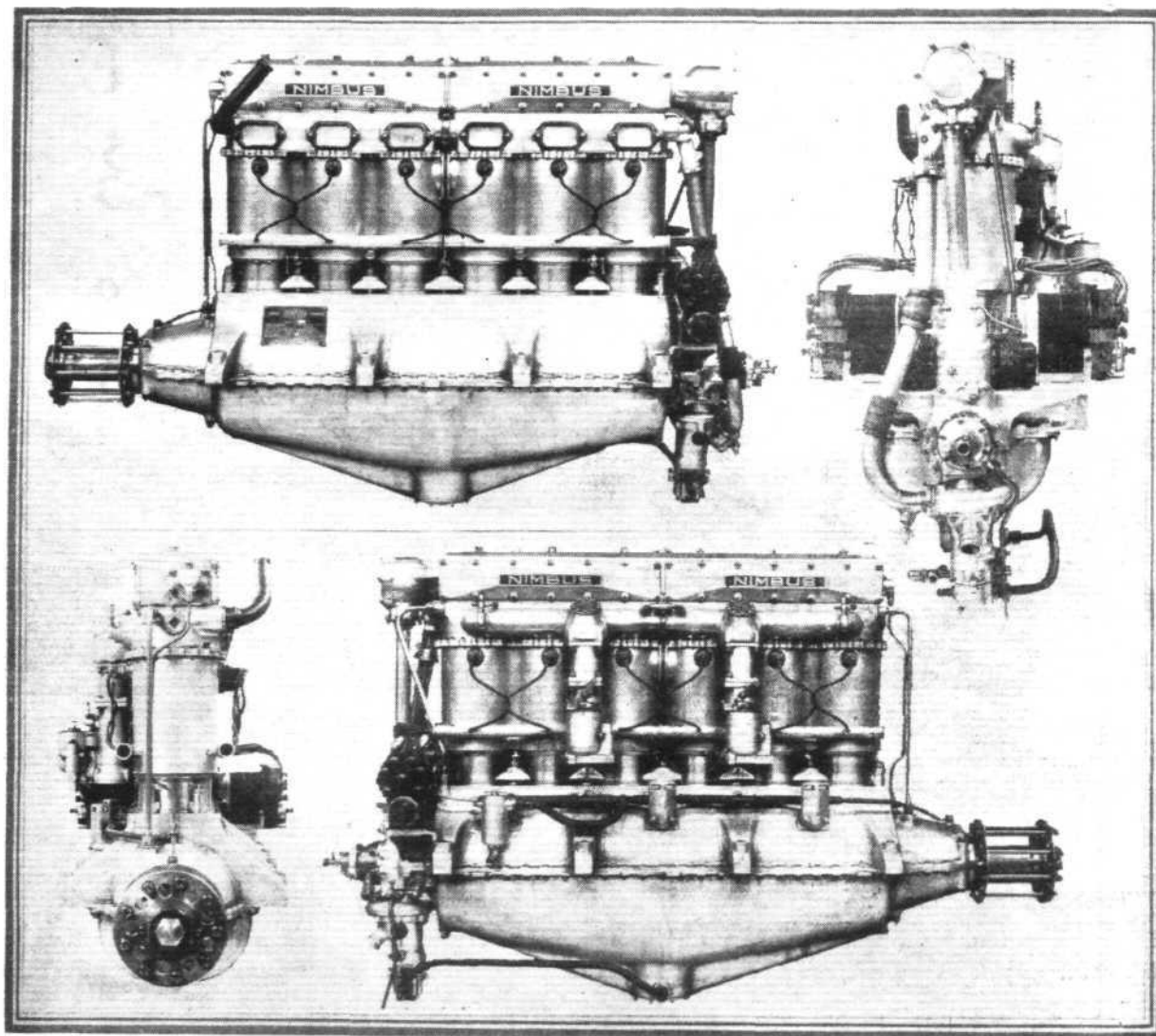
## DESIGNED TO FIT STANDARD "PUMA" BEARERS

335 b.h.p. at 1,600 r.p.m.

ALTHOUGH developed from, and employing a certain number of parts of, the Siddeley "Puma" engine, the new A.D.C. "Nimbus" aero engine is in reality to all intents and purposes a different engine. That the "family likeness" remains is not surprising when it is realised that Major Halford, who had a good deal to do with the original design of the B.H.P. engine from which later the "Puma" was evolved, is responsible for the "Nimbus," as produced by A.D.C. Aircraft, Ltd., at their Waddon factories. From the fact that this firm holds large stocks of "Pumas" and spare parts, it was

"Puma," the cylinder bore having been increased from 145 mm. to 152 mm. The stroke remains the same, i.e., 190 mm., but the compression ratio has been raised to 5.4 : 1. The B.M.E.P. is high, i.e., around 132 lb.

Constructionally, the "Nimbus" differs very considerably from the "Puma" although it is designed to fit the same engine bearers. The steel cylinder liners are screwed into the bottom of the water-jacket blocks, a neat locking arrangement being provided for making a watertight joint. A split locking ring of phosphor bronze is threaded to correspond



THE A.D.C. "NIMBUS" AERO ENGINE : Four general views. Note the clean appearance and small frontal area. The projecting magnetos in the gear-end view are exaggerated by perspective, and do not in fact add a great deal to the width. In any case the fuselage has to be a certain width aft of the engine to give cockpit space, and but little advantage would be gained by altering the mounting of the magnetos.

very natural that Major Halford should take this engine as his starting point, so to speak, and should, while producing an engine of very much larger power, make use of such of the original parts as lent themselves to incorporation in the new design. In this manner a great deal of time and money was obviously saved, and the performance of the "Nimbus" seems to indicate that the method has been amply justified, as will be realised when we point out that in spite of an increase in maximum permissible power from 255 b.h.p. at 1,500 r.p.m. to 335 b.h.p. at 1,600 r.p.m., the weight of the engine "dry" is 655 lbs., which is claimed to be approximately 30 lb. lighter than the weight of the original "Puma."

The "Nimbus" is of slightly larger capacity than the

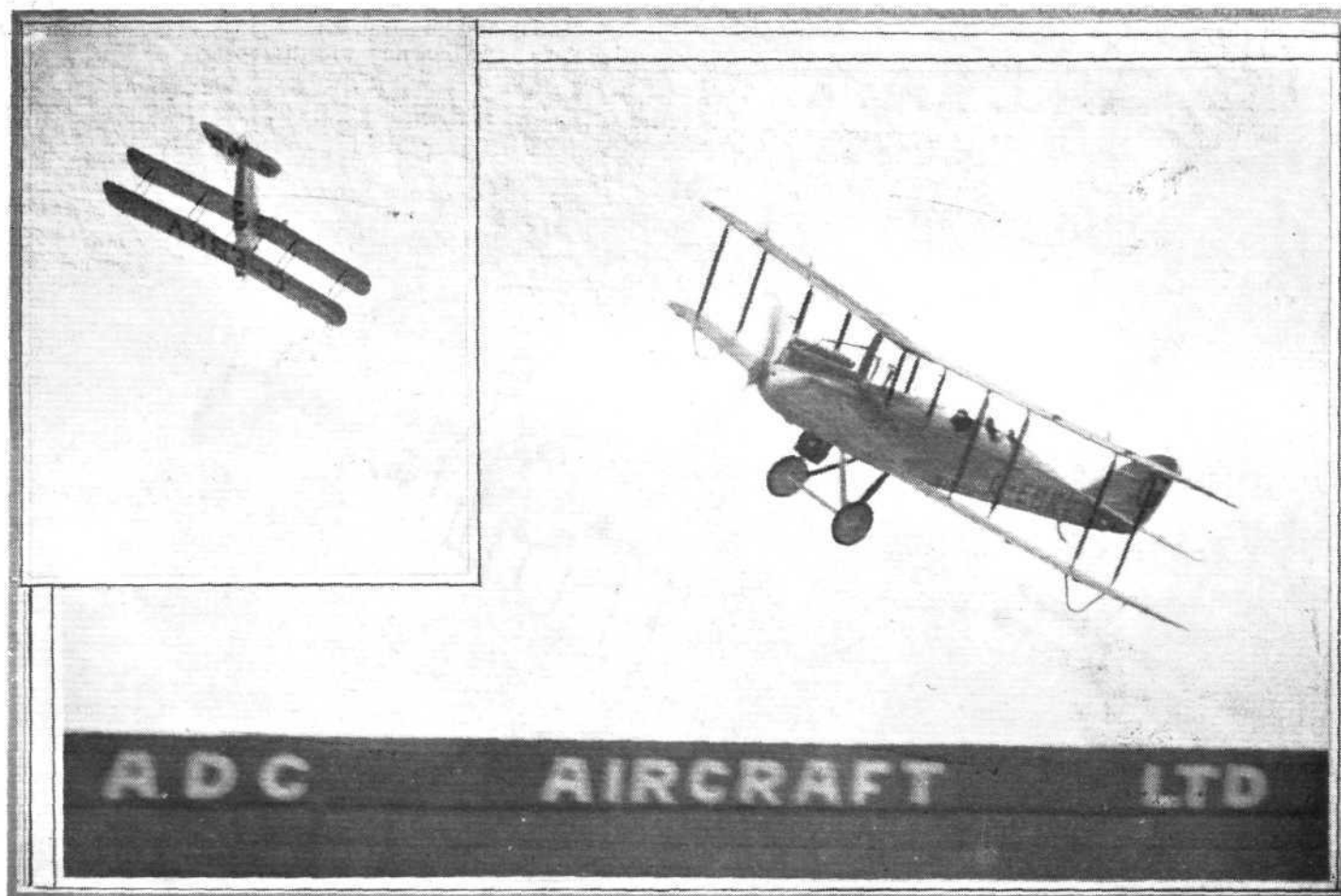
with the threads on the cylinder liner, a steel strap tightened by a tangential bolt forcing the threads home, and a rubber ring, on being compressed, making a tight joint between cylinder and jacket. The split ring and its locking strap are shown in a sketch.

At the top the cylinder liners are secured to the cylinder head castings, which are in the form of aluminium alloy blocks, by the valve seatings, which are of special design and splined on the inside for the special tool used for screwing them home. The water jackets are in the form of two aluminium castings, each block enclosing three cylinders. At the top the water jacket blocks are secured to the cylinder head blocks by a number of bolts, the faces of jackets and

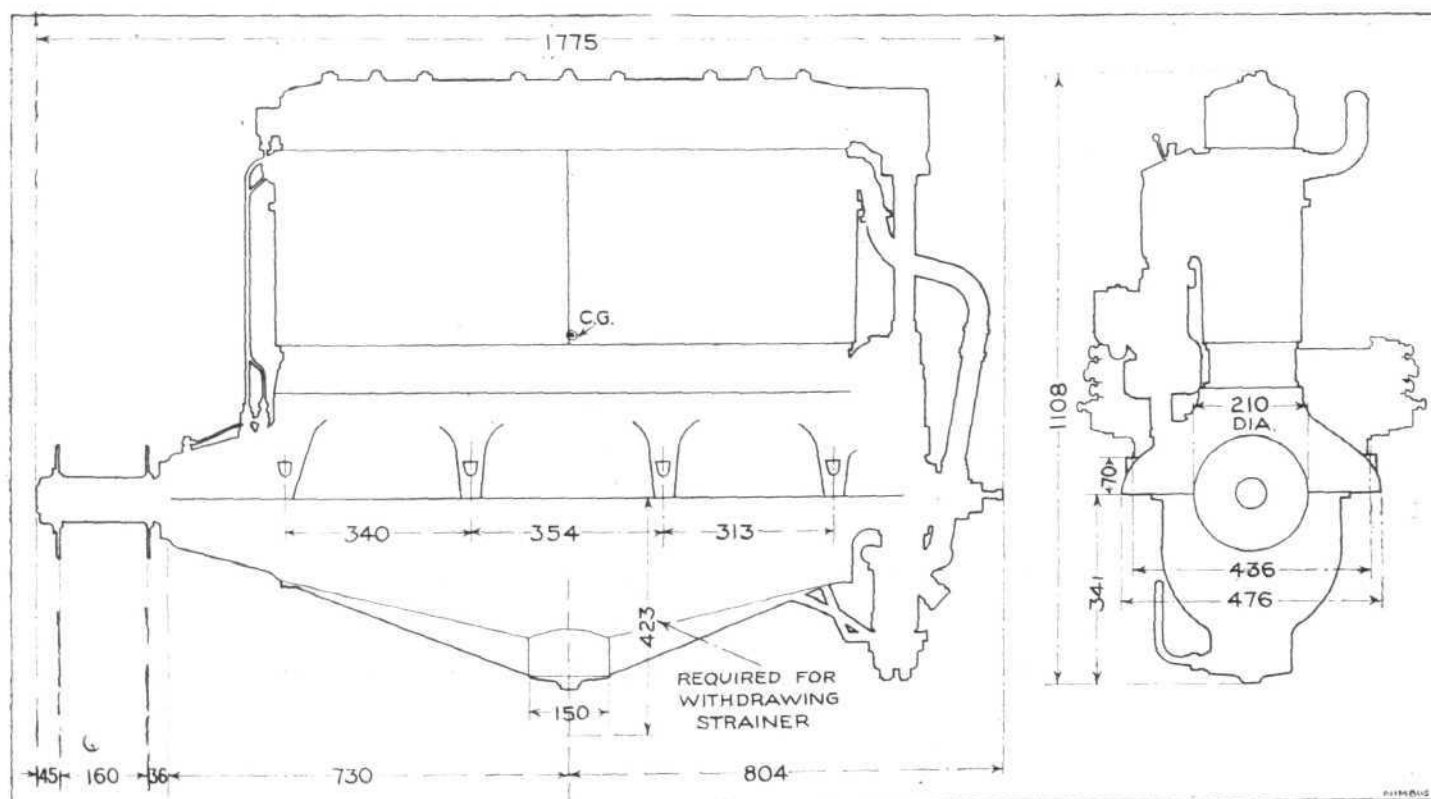
heads being machined to make a tight fit. The cylinder head blocks, as one of our photographs will show, in addition to leaving a large water space around the hottest parts of the engine, are particularly open castings, so that during manu-

facture, inspection is greatly facilitated, and machining operations are reduced to a minimum.

As in the "Puma" there are three valves per cylinder, one large inlet valve and two exhaust valves. The inlet valves



THE "NIMBUS" IN FLIGHT: Mr. Perry flying past the A.D.C. Aircraft works at Croydon Aerodrome, on a D.H.9 fitted with the "Nimbus" engine. Inset, the machine is shown at the top of a loop. With this engine the speed of the D.H.9 3-seater is about 135 m.p.h.

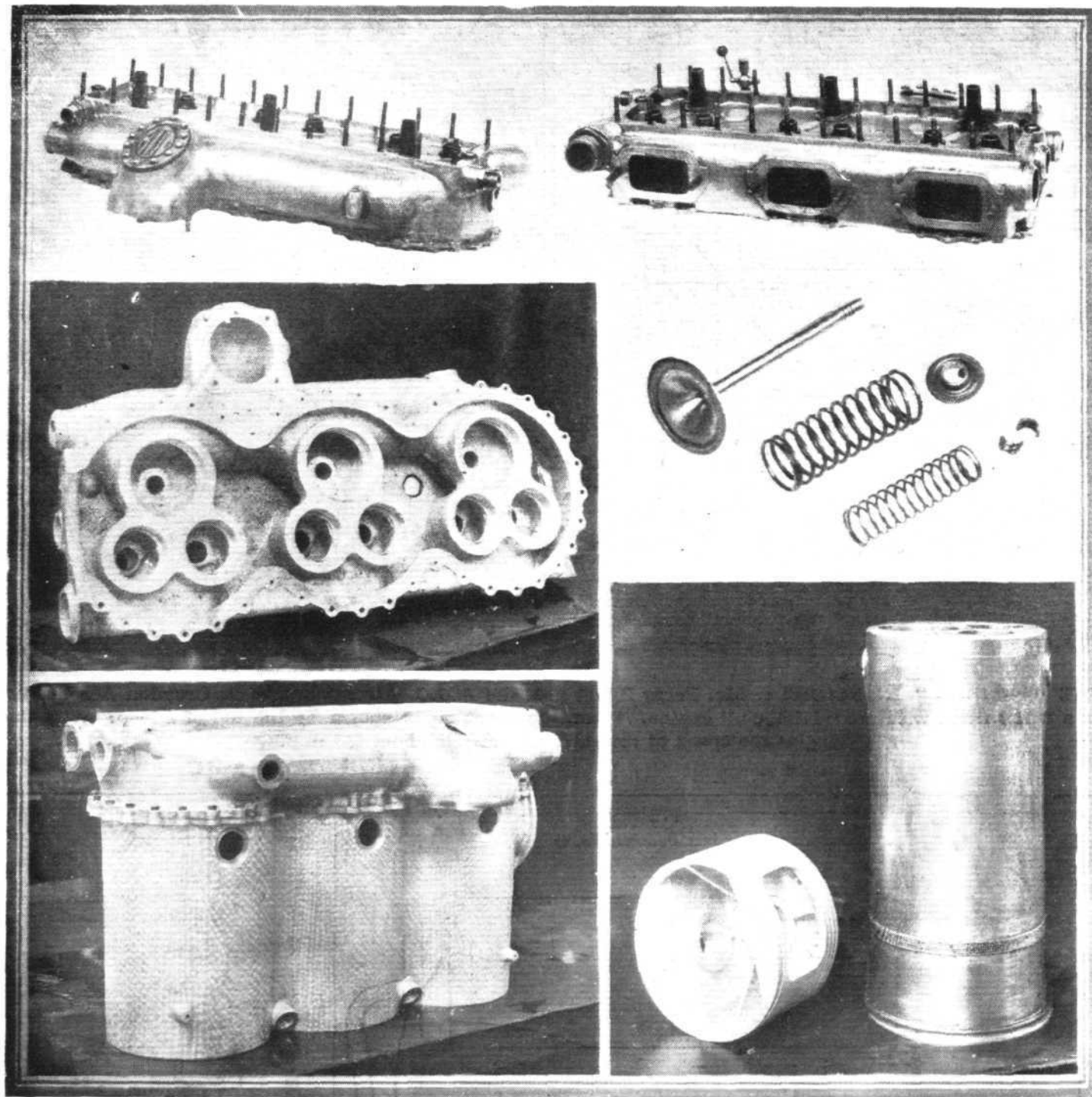


THE "NIMBUS" ENGINE: Installation diagram giving main dimensions.

are operated by short rockers, while the exhaust valves are operated directly from the overhead camshaft. The valve stems have been considerably lengthened so as to give room for longer valve springs, the lift of the valves being rather greater than in the "Puma."

Aluminium alloy pistons of new design are employed, and although they are of larger bore, they are actually lighter than the original. This also applies to other reciprocating

directly to the induction manifold, which is cast integral with the cylinder head block, and it was found that in cold weather some slight trouble was experienced with freezing. This was overcome, in the first engines as fitted in a D.H.9, by a sheet aluminium cowling, but in all subsequent "Nimbus" engines the carburettor will be bolted direct to a water-jacketed inlet cast integral with the jacket, and then the need for a special cowling will disappear.



**THE A.D.C. "NIMBUS" AERO ENGINE:** These photographs show—Above, inlet and exhaust sides of a cylinder head block. On the left, a view inside a cylinder head block, showing the large water spaces surrounding the valves. On the right, an inlet valve with its springs, washers, etc. The photograph in the lower left-hand corner shows a water-jacket block, with its cylinder head block. In future engines the water-jacket casting will have cast with it a water-jacketed inlet. On the right, a steel cylinder liner and its aluminium piston.

parts which, in spite of the greater power developed, are lighter than those of the original engine. The overhead valve gear remains substantially the same as that of the "Puma," as does also the crankshaft. The connecting-rods are of the same type as those of the original engine, but are of slightly different dimensions.

The induction system is a particularly simple one, with two carburettors feeding three cylinders each. In the first "Nimbus" engines built, the carburettors did not bolt

At the moment of writing, the "Nimbus" has not been subjected to the actual Air Ministry type tests, but in the course of the makers' own tests, two of these engines have been thoroughly tried out, the runs including two non-stop runs of 10 hours each under Air Ministry supervision. What with tests on the Heenan and Froude brake, the calibrated airscrew, and in actual flight on board a D.H.9, the first two engines have between them completed something like 150 hours' running.



### Test Runs

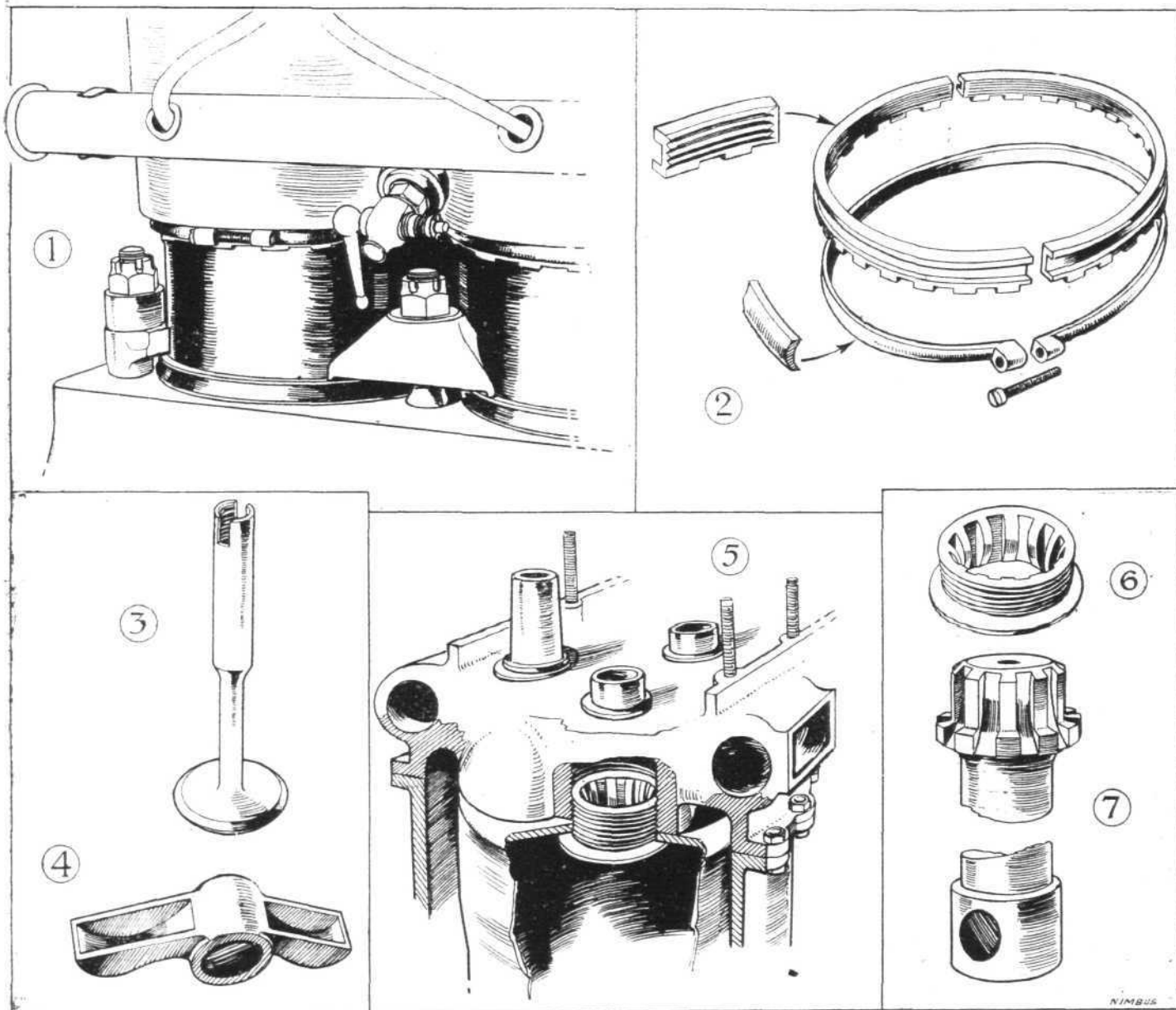
Among the tests carried out at the Waddon Works of A.D.C. Aircraft Ltd., it may be mentioned that on the two 10-hour runs at normal r.p.m. of 1,450 and 90 per cent. of the rated power (270 b.h.p.), the average petrol consumption was 140 pints (79.5 litres) per b.h.p. per hour, which is equivalent to 0.52 pint (0.295 litre) per b.h.p./hour. The fuel used was Shell aviation spirit with the addition of 20 per cent. of Benzol.

As being more representative of actual flying conditions, an endurance test of 35 hours (also officially observed) was completed on the calibrated airscrew, without a mechanical

42 mins.; "Nimbus," 24 mins. Max. ceiling; "Puma," 15,500 ft.; "Nimbus," 19,500 ft.

The speeds obtained with the two engines were:—Ground level: "Puma," 115 m.p.h.; "Nimbus," 134 m.p.h.; at 10,000 ft.: "Puma," 109.5 m.p.h.; "Nimbus," 121 m.p.h.; at 15,000 ft.: "Puma," 102.5 m.p.h.; "Nimbus," 114 m.p.h.

It will thus be seen that the extra power which Major Halford has succeeded in getting out of the "Nimbus" has a very marked effect upon performance when the engine is fitted in the D.H.9. A similar gain would undoubtedly be obtained in other machines, and the "Nimbus" is a striking



THE A.D.C. "NIMBUS" AERO ENGINE: Some constructional details. 1 shows one of the Duralumin dogs holding down the cylinders, while just below the end of the water jacket may be seen the locking strap device of the watertight joint, details of which are shown in 2, in which the castellated split ring is of phosphor bronze and is threaded internally to engage with the threads on the cylinder barrel. 3 shows an exhaust valve with its rocker, and in 5 is indicated diagrammatically the manner of locking the steel liner to the cylinder head aluminium casting by means of the valve seating. The latter is shown in 6, while in 7 is shown the special tool used for locking the valve seating.

failure, at normal r.p.m. and 270 b.h.p. During this test the average petrol consumption worked out at 0.535 pint (0.303 litre) per b.h.p./hour.

Prior to the 20 hours a power curve was officially checked by Air Ministry officials, the results being given in the table at end of this article.

In order to obtain a basis for comparison, a D.H.9 has been tested with full load, both when fitted with the standard "Puma" and with the "Nimbus" engine, when the following results were obtained: Climb to 6,500 ft.: "Puma," 10.3 mins.; "Nimbus," 7.7 mins. To 10,000 ft.: "Puma," 18.8 mins.; "Nimbus," 12 mins.; to 15,000 ft.: "Puma,"

proof of the opinion advanced by Commander J. Hunsaker during a lecture at the R.Ae.S., when he stated that although there might not be any great gain in reducing the weight of existing engines, there would be an immediate gain in keeping the engine weight and size the same, but increasing the power. In the "Nimbus" the remarkable features are: the low weight per h.p. (under 2 lb.), the low fuel consumption, the relatively low engine speed (1,450 normal, 1,600 maximum), and the very small frontal area, which latter allows of an engine installation offering a small head resistance.

As to the scope for an engine of this type and power, and bearing in mind that the engine has been designed to be pro-

duced cheaply, it is not difficult to imagine types of machines for which it would be extremely useful. One of the most obvious is, of course, the D.H.50, into which the "Nimbus" would fit without alterations to the machine. The extra power should effect a great performance improvement in what is already an excellent machine. Then there is the question of 3-engined aeroplanes. A total power of in the neighbourhood of 1,000 h.p. should enable a very useful machine to be produced, and the low frontal area of the "Nimbus" would give the aircraft designer an opportunity to produce a very "clean" machine.

Perhaps a little further out in the future, but still a logical development, is the possibility of combining two banks of

"Nimbus" cylinders into a Vee 12-cylinder engine of small frontal area and developing some 650 h.p. to 700 h.p. Such an engine seems to be the type required in the future, and Major Halford should have no great difficulty in producing a double "Nimbus" on these lines. We offer the suggestion for what it is worth. Technically, there does not appear to be any insuperable obstacle in the way. In the meantime, however, there should be a very large demand for the "Nimbus" as it stands, and as the A.D.C. Aircraft Company has recently installed at Waddon machinery for the quantity production of the "Cirrus" engine, it should not be long before the "Nimbus" is being similarly produced in quantities.

### Nimbus Engine No. 2. Power Curve.

R.P.M.	Load.		Corrected.			Per Pts.	Fuel Consumption.			Oil Temp.		Water Temp.	
	Lbs.	Kgs.	B.H.P.	B.H.P.	B.M.E.P.		Hour.	H.P. Hour.	Litres.	In.	Out.	In.	Out.
1,600	251.5	114	335.5	334.4	131.2	171	97.1	0.51	0.289	54	68	55	78
1,450	255	115.6	308	307.1	132.3	157	89.2	0.509	0.289	60	65	58	75
1,350	257	116.5	288.2	287.3	133.2	147	83.5	0.508	0.288	58	63	60	78
1,250	255	115.6	266	265.1	132.8	135	76.7	0.508	0.288	57	62	62	76
1,150	254.5	115.4	244	243.1	132.3	127	72.16	0.52	0.295	53	60	63	76
1,250	255	115.6	266	265.1	132.8	134	76.1	0.504	0.286	48	58	63	—
1,350	255	115.6	286.5	285.6	132.2	144	81.8	0.502	0.285	50	58	63	75
1,450	255	115.6	308	307.1	132.8	156	88.6	0.506	0.287	50	60	63	74
1,600	250	113.3	333.8	332.9	131.2	170	96.6	0.51	0.289	50	60	63	77

Date 16/11/25. Barometer 29.99 ins.

The shop temperature was 59° F.

## LIGHT 'PLANE CLUB DOINGS

### London Aeroplane Club

The following members had flying instruction: D. P. H. Esler, Sir John Rhodes, N. Jones, H. R. Presland, R. P. Cooper, A. H. M. Lees, J. Barros, J. S. M. Michie, R. C. Presland, G. N. Howe, E. D. E. Moss, L. Anderson, R. Malcolm, S. O. Bradshaw, F. S. Adams, F. C. Elford, D. Kittell, S. D. Durkan, W. E. P. Johnson, E. L. Brough, A. P. Hunt, J. H. Safery, E. A. Cook, T. H. O. Richardson, C. Quirk, A. R. Ogston, K. V. Wright, F. W. Eady, B. B. Tucker.

The following Members flew solo:—Mrs. S. C. Elliott-Lynn, Major Beaumont, G. H. Craig.

There is still only one machine available and the total flying time for the week was 26 hours. The total flying for the month of February was 68 hours (dual 55 hours 35 mins., solo 12 hours, 25 mins.).

The delivery of the new D.H. "Moth" to replace G-EBLU which was written off, is promised for the end of the month. All efforts to acquire another machine to carry on in the meantime have failed. In view of the recent donation from the Petroleum Distributing Companies the London Aeroplane Club has placed an order with the De Havilland Aircraft Co., Ltd., for a third D.H. "Moth" of which delivery is promised in April.

Towards the cost of this machine the following donations have been promised:—Petroleum Distributing Companies, £200; Mr. E. S. Jones, £150; Major K. M. Beaumont, £20; Mr. W. Hay, £20; V. H. Doree, £20; Mrs. S. C. Elliott-Lynn, £10.

Members wishing to assist with donations towards the purchase of this machine are requested to send their names to the Secretary, London Aeroplane Club, 3, Clifford Street, London, W.1.

### The Lancashire Aero Club

The weather has permitted flying on most days this week, GEBLV and GEBMQ being the machines flown. Mr. N. T. Stack, who commenced his duties on Wednesday, gave instruction to:—

A. Goodfellow, 20 mins.; C. Agar, 1 hr. 40 mins.; A. Macnair, 1 hr. 25 mins.; M. Lacayo, 10 mins.; B. Smith, 1 hr. 25 mins.; J. Leeming, 1 hr. 15 mins.; S. Harper, 20 mins.; A. Wade, 1 hr. 15 mins.; H. Hardy, 20 mins.; C. Parker, 30 mins.; K. Colley, 15 mins.; L. Slater, 20 mins.; P. Michelson, 15 mins.; T. Wilkinson, 40 mins.; A. Goodyear, 15 mins.; S. Crabtree, 15 mins.; D. Dyson, 20 mins.; R. Williams, 25 mins.; D. Tummers, 25 mins.

Mr. Scholes gave dual to the following:—

A. Macnair, 25 mins.; R. Williams, 10 mins.; F. Davison, 30 mins.; S. Crabtree, 30 mins.; J. Leeming, 40 mins.

Mr. Cantrill gave A. Goodyear 20 mins. dual.

Solo flights by A. Goodfellow, 40 mins.; M. Lacayo, 40 mins.; T. Cantrill, 15 mins.

Tests occupied 1 hr. Total dual 14 hrs. 15 mins. Total solo, 1 hr. 35 mins. Total time flown, 16 hrs. 50 mins.

### The Newcastle-upon-Tyne Aero Club

Week ending February 28.—Total time flown by members, 16 hrs. 15 mins., made up as follows: Dual, 12 hrs. 30 mins.; solo, 1 hr. 30 mins.; pilot members, 1 hr. 45 mins.; passenger, 30 mins.

Dual with Maj. Packman was carried out by Mrs. Marcks, Miss Leathart, Messrs. MacMillan, Shaw, Wardill, L. Smith, Sandilands, Twine, C. Thompson, W. Todd, J. H. Johnstone and R. Whitfield.

Solo, Miss Leathart and Mr. MacMillan.

Pilot members solo: Mr. R. N. Thompson, Mr. N. S. Todd, all of whom carried passengers.

Mrs. W. B. Ellis was the only passenger carried during the week, going up with Maj. Packman, originally for 15 mins., but requesting at the expiration of this time, a further 1 hr., and on being asked by Maj. Packman if she would like a loop, replied, "Yes, one," which she had, much to the surprise of her son and grandson, who were on the ground. Mrs. Ellis stated on landing that she had thoroughly enjoyed it.

The total number of flights during the month of February was 129, and the hours flown 68½, all but six hours had been completed on L.X. Ten members have been taught to fly and six have now obtained their certificates. As the club has had to operate on one machine only during the past two months, it is not possible for members who have reached the solo stage to

be launched so as to enable them to carry out sufficient practice to "pass out," two or more machines being absolutely necessary to allow of pilots being trained up to the obtaining of their licences. Thanks to the generosity of the petrol distributing firms, and local promises of assistance, it appears that better times are ahead, however.

On Wednesday Mr. MacMillan was launched solo, putting up a very good performance during three flights, though one of these was the cause of some alarm, the wind changing completely round from east to west, and it was feared that Mr. MacMillan had not noticed it. His attention was drawn to the matter by one of the many signals used, and he made a perfect landing.

Miss C. R. Leathart went off solo after a short dual flight and flew round very nicely, but misjudged her landing the machine turning over on touching the ground. The hard-working L.X., on which all instruction has been carried out to date, will now have a rest, though it is hoped that the repairs can be carried out at the aerodrome in order to save time.

It had been arranged that Maj. Packman should go to Stag Lane to bring up L.Y. on Wednesday night, which he did. A very successful journey from London to Newcastle was accomplished, in spite of very bad weather conditions, the visibility being bad throughout the flight, necessitating flying at between 200 and 300 ft. the whole way. He arrived safely, having made good time, and bringing messages from Commander Perrin from Stag Lane, the Lord Mayor of Leeds and Prof. Brodetski, Chairman of the Yorkshire Club, these letters being despatched to the city by motor-cyclist on arrival, it being too late for the Lord Mayor of Newcastle and the Chairman of the club to be present at the aerodrome on account of engagements.

Sunday brought forth glorious sunshine, and one of the most interesting days since the beginning of flying at Cramlington was enjoyed by a large number of members.

A large number of hours and much energy had been spent during the week in efforts to start the Blackburne engine of Mr. Ellis's Gnospelius "Gull," without success. Mr. Lancaster Parker had been invited to come up to fly the machine for the first time. Mr. Ellis had been anxious to fly it himself but the obstinate engine prevented this being done. Mr. Parker's presence must have impressed the engine, for it started obediently when he took charge of the operations.

Running off straight from the tac-mac everyone one was surprised to see the machine take off after what was considered to be quite a short run, as it was understood that he meant to taxi round the aerodrome to run up the engine, which has been thoroughly overhauled, and many of the parts are new. He made one large circuit and a perfect landing. During the period of the flight Mr. Ellis went off to get his flying kit, and others went for cameras. Maj. Packman asked if he might have a flight soon, as he had a number of pupils waiting for dual, and Mr. Ellis sportingly told him to take it right away. This he did, handling the machine well, and turned to return to the aerodrome, but suddenly the nose of the machine went down and a splutter of the engine was heard. It appeared that he had gone into a small pine wood, but this was not so, as a perfect landing had been made in a field beyond it. The cause being that he had taken off with about a teaspoonful of petrol, the tank being perfectly dry. It took 14 members to push the "Gull" over the fields and lift it over hedges back to the aerodrome, and they found it very hard work, though the machine was empty, and everyone has great respect for the wonderful little 5-6 Blackburne engine now. Considering that it would be necessary to remove the wings to get it home, Maj. Packman flew over with Mr. Brown as passenger, and the latter dropped a bag containing the necessary tools near to the machine, and as the "bomber" was subjected to some leg-pulling regarding his aim, it is feared that there will be some difficulty in obtaining volunteers to salvage future machines if tools are to be dropped, as he will doubtless wish to prove that he can find his target next time.

Please note change of address of registered office, which is now at Cramlington Aerodrome, Northumberland.

All communications and parcels sent per Parcel Post should be addressed as above. Goods sent by rail should be addressed to Cramlington Station, L.N.E.R. Telephone, Cramlington 9.

### Civil Marine Aircraft

We would remind our readers that it is on Tuesday of next week, March 9, that Mr. O. E. Simmonds is reading his paper on "The Development of Civil Marine Aircraft," before the Institution of Aeronautical Engineers. Mr. Simmonds has collected a good deal of very valuable infor-

mation relating to the component weights of a variety of types, information that has not hitherto been available, and his paper should thus be of more than ordinary interest. The meeting will be held in the Lecture Room of the Junior Institution of Engineers, 39, Victoria Street, and will commence at 6.30 p.m.



## CORRESPONDENCE

*The Editor does not hold himself responsible for opinions expressed by correspondents. The names and addresses of the writers, not necessarily for publication must in all cases accompany letters intended for insertion in these columns.*

### SLOTTED CONTROL

[2125]. I have read Mr. F. Courtney's article in your issue of the 26th inst., with more amusement than apprehension, especially in regard to his remarks on slot control.

I think, in fairness to all concerned, Mr. Courtney should first explain how he arrived at the conclusion that slot control is of no value, when he has only flown the machine for an infinitesimal period.

According to reports seen in the press, he is of opinion that no new machine or arrangement can be tested and thoroughly reported on unless numerous routine tests such as taxiing, short hops, and then extended flights are carried out. I think I am right in stating—if not, I apologise—that he will not test a new machine for any firm unless these tests are allowed.

The only conclusion one can arrive at is that Mr. Courtney is grossly exaggerating the "technique" of test flying.

Mr. Courtney has had a considerable amount of experience in flying, including bad landings and stalling, so should be able to judge the dangers of these manoeuvres when there is insufficient control.

Now for his condemnation of the "slotted control," which is carried out in a purely non-technical manner. If he had taken the trouble of reading and at the same time digesting the various reports issued on the subject, he would have a more elastic mind.

In the first case, he states that the rolling is very large and sudden with a positive yaw. It would have been wise to state whether this is in relation to a positive or negative roll. It may interest him to know that the suddenness of the roll and direction of yaw can be arranged for any degree by suitable arrangement of slot length.

Another point he makes light of is the case of control above the stall, and goes on to state that control below the stall is more important. I am of opinion, and no doubt others will agree with me, to obtain control beyond the stall and control below the stall will be all that is desired.

It is all very well saying that commencement of stalls are not accidental but deliberate. It commences as cold comfort to the unfortunate pilot who has stalled and would have got away with it if he had been able to keep his machine on an even keel and pancake on to the ground at a velocity not exceeding 16 to 20 ft.-secs.

It is well known that when ailerons are used above the stall the down aileron has the effect of producing a very high value of drag, and, in consequence, reducing the speed of the wing on that side, which is the opposite effect to that desired.

The "slot control" produces a very high rolling moment and at the same time reduces the drag on the side of the wing with the aileron down, making all motions occur in the direction of turn.

As regards the point that a large rudder will have the same effect, this is not denied; at the same time, the other side of the question must be considered. In quite a number of accidents the cause can be put down to the negligent use of the rudder and executing a flat turn; the nose falls, and the pilot endeavours to pull it up with the stick, so completing a manoeuvre over which he has no control.

If larger rudders are fitted, they will have to be no heavier than the existing size as regards hinge moment. In consequence, if they are used negligently, the time in producing a spin, as explained above, will be considerably decreased, due to the much larger yawing moment. The reply will probably be that opposite rudder will check the spin. Unfortunately, the first half-turn of a spin means a considerable loss in height, and if the machine is anything within 50 ft. of the ground the result will be disastrous.

The illustration of a machine executing a "falling leaf" is a stunt, and it is only with the utmost care that this can be executed to avoid a considerable loss of height between each movement of the rudder.



### Royal Air Force Club

THE annual general meeting of the Royal Air Force Club will take place at 5 p.m. on March 10, at the Club premises, 128, Piccadilly, W. 1.

### Imperial Airways—Sunday Services Resumed

IMPERIAL AIRWAYS, LTD., announce that the 12 o'clock service to and from Paris on Sundays will recommence on March 7 until further notice, and will be duplicated or triplicated as necessary. Also, owing to the continued falling

From the designer's point of view exceptionally large rudders would add to the problems of design. In the case of the "Avro" with large rudder, some of the grounding angle was forfeited to accommodate it. Its run after touching the ground must be considerably increased, which is a bad enough snag in itself. To get over this difficulty, the rudder must go on top of the fuselage, then increased torsion enters into it and an increase in weight to take the loads.

As regards the weight of slot for "slot control," the amount is negligible and is more than justified by the amount of control obtained. As for its being a "gadget," "Rome was not built in a day," and Mr. Courtney's acquaintance was with a first attempt at solving the problem of control at slow speeds, which was fitted to an "Avro," mainly for the purpose of confirming wind-tunnel results. Needless to say, these were more than confirmed.

Later tests, when published, will go to show that his remarks in regard to "slot control" are fallacious.

Mr. Courtney will, perhaps, consider his remark of the "psychological effect" in stalling to the "Auto-Gyro" and its effect on common or garden pilots who would be asked to fly it at its present stage of progress.

These few remarks are for the pilot in this category, and not for the expert, who needs "naught" of these gadgets to bring him safely to earth. At the same time, may I remind Mr. Courtney that aeronautics is still a young science and its furtherance is not helped by *argumentum ad ignorantiam*.

R. REYNOLDS

Cricklewood.

February 27, 1926.

### ENGINE FAILURE AND STALLING

[2126]. Permit me to congratulate you on the excellent beginning made by you in the *AIRCRAFT ENGINEER*. An open forum for technical discussion has long been needed and such an article as that by Captain Courtney on "Stalled Flight and Control" is a very valuable beginning.

He will forgive me if I say that I think neither he nor the Aeronautical Research Committee have pushed their studies to a logical conclusion. Both have stopped thinking too soon.

I have read more than a couple of hundred reports of stalling accidents, almost all fatal. The history is nearly always the same. Engine failure, generally on getting off, followed by an attempt to land in a field just out of reach, or by an attempted turn back into the aerodrome.

The engine failure is the root of the difficulty; it creates the circumstances accepted by both Capt. Courtney and the A.R.C. as leading to stalling accidents. I have never heard of a stalling accident to a machine the engine of which was, beyond question, functioning satisfactorily.

To me the only conclusion is that for machines operating overland, enough engines must be fitted for the aircraft to climb with one broken down. Following that, adopt the safeguards in design and training recommended by Capt. Courtney.

I would make two reservations in respect of the above opinion: (1) it does not apply to seaplanes because they do not have to turn back into an aerodrome, and do not have to reach a given field; (2) in a certain number of military and racing machines, the advantages to be gained justify the use of single-engine types. This latter condition may always hold for the single-seater fighter, but I see signs of it dying out for two-seaters and larger types of war aircraft. On civil types my opinion seems to be already borne out by current practice.

B. THOMSON, A.F.R.Ae.S., late Capt. R.A.F.

Cowes, I.W.

February 27, 1926.

of the French franc they will, in conjunction with the French Air Union Co., increase the fares from Paris to London (as from March 1) to 700 francs single and 1,300 francs return. There is, however, no alteration in the London-Paris fares, which stand at £5 5s. single and £10 return.

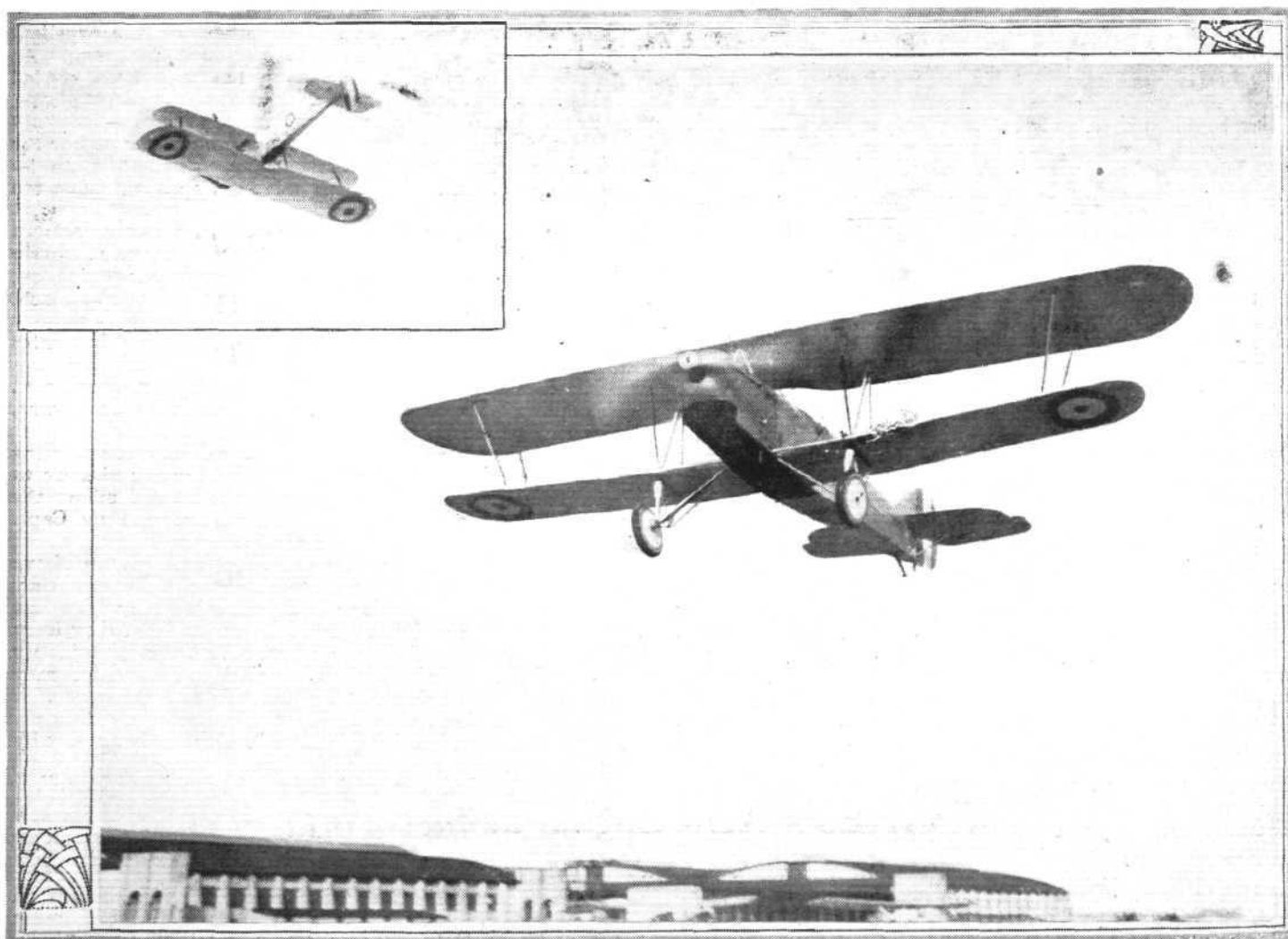
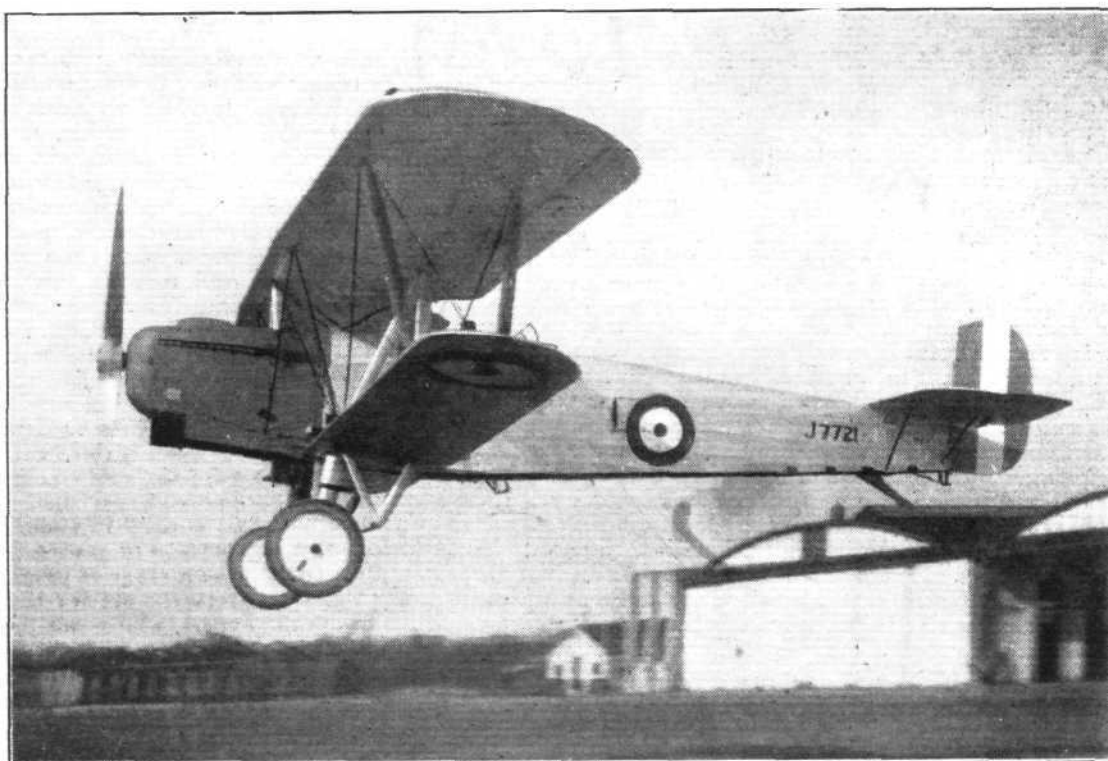
### Athens-Cairo in 10 Hours

An all-metal Junkers F.13 seaplane, equipped with a Junkers L.2 engine, recently made a flight from Athens to Cairo, a distance of over 800 miles, in 10 hours.

## A MODERN DAY-BOMBER

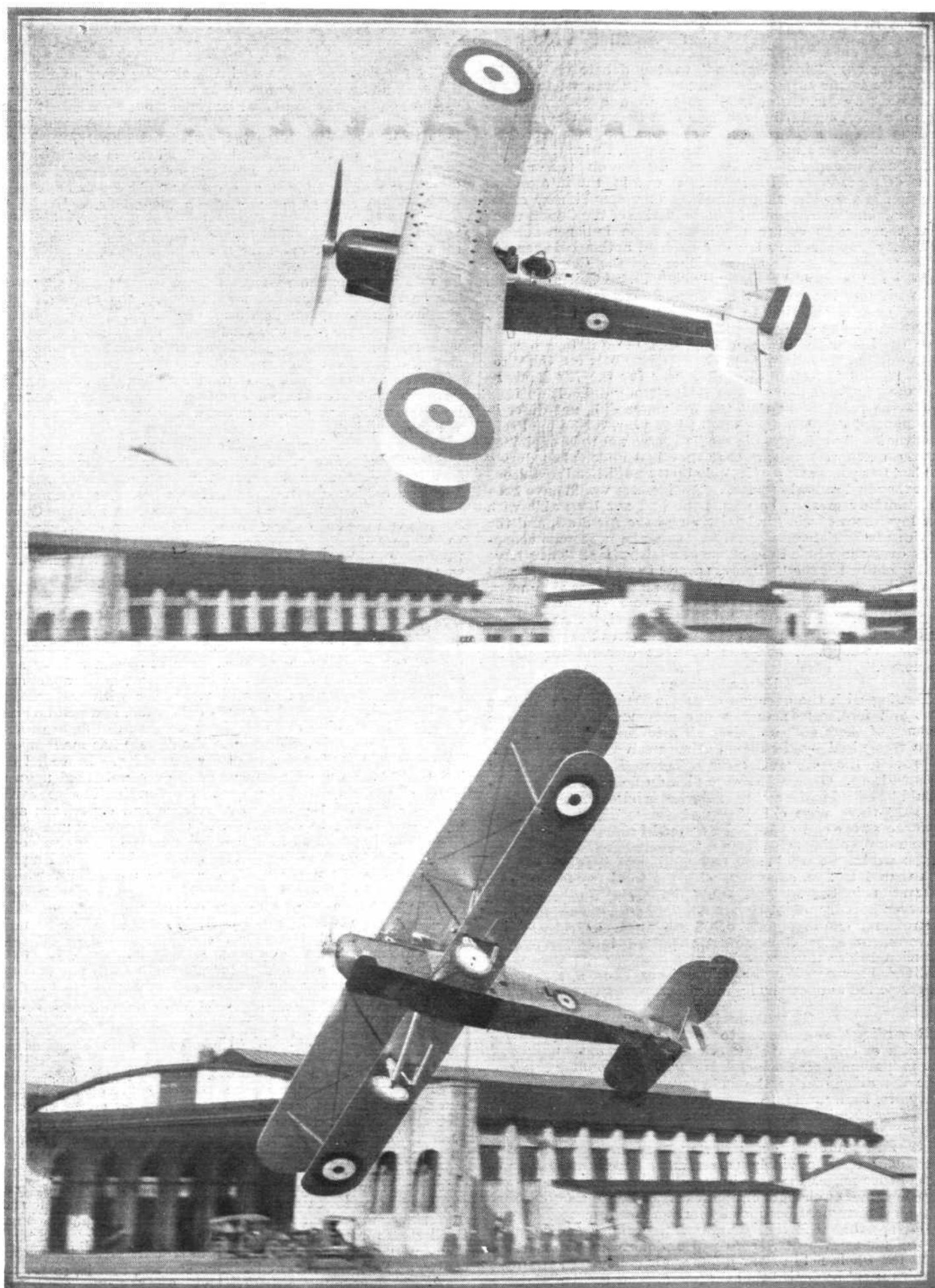
The "Fly-Past":  
The Hawker  
"Horsley," with  
Rolls-Royce  
"Condor" en-  
gine, crossing  
Brooklands at  
speed, piloted  
by Flight-Lieut  
Bulman.

FLIGHT Photograph.



[FLIGHT Photographs.]

**AT FULL SPEED:** The Hawker "Horsley" with Rolls-Royce "Condor" engine, piloted by Flight-Lieut. Bulman, flying past the hangars at Brooklands. The inset shows the machine at the top of a loop, an evolution which this astonishing machine seems to perform with the greatest ease. (See also pages 121 and 129.)



[Flight Photographs]

THE "CYGNET'S" BIG BROTHER: In spite of its powerful "Condor" engine, Mr. Bulman handles the Hawker "Horsley" as if it were a light 'plane, as these photographs show, and in his hands the manœuvrability of the machine is extremely good. (See also pages 121 and 128.)



# THE AIR ESTIMATES

## Sir Samuel Hoare's Speech in the Commons

A NOTEWORTHY "introduction" to the debate on the Air Estimates in the House of Commons on February 25 was the statement by Mr. Baldwin (in reply to a question by Mr. Ramsay MacDonald) in which he said that the Government had no intention of reopening the question of a separate Air Arm and Air Ministry. It was, he said, their intention to follow the organisation of Imperial defence on the existing basis of three co-equal services. It was in the interests of the fighting services that all controversy should now cease, and he definitely announced the conviction of the Government that the way to ensure the co-operation indispensable to efficiency and economy lay in combined action between the three services through the machinery of the Committee of Imperial Defence and the recently constituted Chiefs of Staffs.

In his opening remarks Sir Samuel Hoare, Secretary of State for Air, referring to the Prime Minister's statement, said that he was glad that it had been made, for he was sure that the longer the idea remained that the question was an open one the worse it was for the relations between the three Services and the more difficult it was for the Air Ministry and the Air Force to carry out their already difficult duties.

Having pointed out that the Estimates did not differ in any marked degree from those of last year, Sir Samuel said that the small net increase in the Estimates was to be explained by the new developments that they had undertaken during the last few years and particularly by the additional squadrons that they had recently formed. The increase would have been substantially greater, he said, if he had not been able with the loyal help of the Air Ministry and the Air Staff, and the advice of the Colwyn Committee, to make numerous economies over the whole field of air administration. They have had to cut out of the Estimates several items that they should have liked to include, but they have all felt that they must loyally take their share in the effort to keep down public expenditure. "I maintain" said Sir Samuel, "that we have held the balance not unsuccessfully between the urgent need of air development and the insistent demand for public economy."

### Home Defence

Dealing with the question of Home Defence he said that first and foremost there was our paramount duty for the defence of these shores against air attack—a duty that had been recognised by the action of successive Governments in approving the programme for a Home Defence Force of 52 squadrons. Of these 25 were already formed, and 3 more would be added in the course of the financial year. Thus whilst in 1922 there were only 3 squadrons available for Home Defence at the end of 1927 there would be 28. Although we were today, setting aside Russia, the second greatest air power in the world, we would still be in an inferiority of somewhat less than 1 to 2 as compared with the total strength of our nearest neighbour. This could be allowed to continue, however friendly might be our relations with our neighbours. Therefore our programme of Home Defence accepted by Government after Government remained intact, the only question before the House being whether or not they were justified in spreading the expenditure over a somewhat longer period than originally intended.

### The Aircraft Industry

Regarding the question as to whether they were not running the risk of crippling the aircraft industry by slowing down the programme, Sir Samuel said: "I do not wish to under-rate the difficulties of the industry. They are very great. They are, I am afraid, inherent in the position of an industry that depends almost exclusively upon the orders of a single Government Department. I do not believe that there is any other important British industry that is so exclusively dependent upon a single Government Department. This dependence means that the industry is the victim of changes of policy, and of changes of policy carried out not only by the British Government but also by foreign governments. For it is obvious that if foreign governments decide upon a reduction of air armaments, there will undoubtedly be reactions upon the whole field of our military air policy. I am afraid that it cannot be denied that the fewer orders the Air Ministry gives to the British firms, the weaker these firms become for potential expansion in the future. I can assure the House that I have not ignored this fact in preparing my Estimates."

"Whilst, however, I do not deny the fact that the slowing down of the programme reacts upon the industry, I am convinced that there is no cause for the extreme alarm that

many people feel. Even with the slowing down of the programme, the amount paid out to the industry in the course of the year will be the third largest amount paid to it since the war, and three and a half millions more than was being paid to it when I came to the Air Ministry in 1922. These facts should be kept in mind when alarmists speak of ruin and disaster. So far as employment is concerned, I shall do everything in my power so to spread the orders as to keep as many key men as possible in the various firms."

He further proposed to help the British aircraft industry to obtain markets abroad, by relaxing the restrictions placed by the Air Ministry upon the sale of new types.

Coming to the other principles of our air policy, he said he would not at the moment say anything in detail about the provisions of air force for the Navy, the Army and the Empire Garrisons, but he would say in passing that, so far as the Fleet Air Arm was concerned, it was fully equipped with post-war types, and had the most efficient flying personnel of any Fleet Air Arm in the world. As to the squadrons with the Army, he was glad to think that the co-operation between the forces became closer every year; and that the lessons of the Army manoeuvres would be of great value to the two Services.

### Empire Air Routes

After brief reference to the air work in the Empire—Iraq and India—Sir Samuel dealt with the question of Empire Air Routes, the military and civil sides. He referred to the long distance Empire flights (by the R.A.F.), the Cairo-Nigeria and the Cairo-Cape Town, started last year, and which would be followed by others. Upon the civil side, he said they were hoping to make a definite start with the aeroplane route to India during the course of the year.

### Airships

"Our airship programme," proceeded Sir Samuel, "is not less important from the point of view of Empire air routes. There again we may look forward to substantial advances during the next twelve months. We have had a busy and eventful year with research and experiment, both model and full-scale. Hon. members will remember with satisfaction the fine achievement of the crew of the R.33, and will be glad to hear that we obtained both from the eventful flight of last Easter and the other flights that the airship has made, most valuable data for the design of the new ships. Indeed, I do not think that the Government have ever embarked upon a great experiment with so fixed a determination to avail themselves of all the lessons of science and experience and to leave nothing to chance. Our airship programme is of such vital importance in the development of Empire communications, to say nothing of its value in the field of Empire defence, that I am particularly glad to state that, whilst certain items of the cost are being spread over a somewhat longer period than was originally contemplated, no substantial change is being made in it. I do not wish to tie myself down to exact dates for the completion of so difficult an experiment, but I have made no secret of my view that, as things are, the two airships should, before the normal life of this Parliament comes to an end, have brought London and Bombay nearer together than were London and Edinburgh a century ago."

### The Training of an Air People

"I come to the last and by far the most important objective that we have in mind, the creation of an instructed public opinion upon air questions and an expansion of air knowledge and air practice in a much wider circle than at present exists. Honourable Members have described this effort as the effort to create an air sense, without which we shall never become an air people. This is a fine-sounding phrase, and I wish to give the House an idea of the way in which we are trying to translate it into action. . . . We are trying to extend air knowledge in three directions. We are trying, in the first place, to extend the knowledge of air defence beyond the limited ranks of the Air Force by the creation of Auxiliary and Special Reserve squadrons near our great industrial centres. This experiment has now started, and is, so far as I can see, developing satisfactorily. In 1926-27 we propose to carry it a stage further. We are not forcing the pace, as we wish from the very outset to get the right type of officer and the right type of man."

Secondly, continued Sir Samuel, there was the effort they were making to bring our air programme into much closer contact with the science of the country, and particularly with

the science at the Universities. We had reached a most important point in the history of aviation, and they needed not only the able efforts of the Air Ministry, but also the help of scientists outside. It was for this reason that he had carried through a reorganisation of their Research Department which, under a newly-created Director of Scientific Research, would be able to concentrate their efforts more directly upon scientific research. For example, Sir Samuel referred to the problems of the control and stability of the aeroplane, of metal construction, of supercharged engines, and of the "Auto-Giro."

Lastly, there was the attempt they were making to bring aviation within the reach of the ordinary citizen. Five light aeroplane clubs had already been started, and already had been joined by about 1,000 members. He believed that this movement would greatly extend in the future and that, so far as the ensuing year was concerned, would be given a stimulus by the light aeroplane competition in the autumn, for which the *Daily Mail* had offered substantial prizes.

They were also trying to bring the Service into closer connection with the industrial life of the country; the Institute of Mechanical Engineers had already decided to regard training in the Air Force as an alternative qualification for the entry of an associate.

#### Co-operation between the Services

Concluding, Sir Samuel pointed out that it was a big programme—one that needed the concentrated efforts of everyone connected with it. He hoped that they would have no more sudden changes of Government policy, and that the controversies over the existence of an independent Air Force would also cease. The Air Force had established itself in the life of the nation, and year by year it was increasing in efficiency and esprit de corps. It existed for the purpose of meeting a definite and very urgent national need, and Government after Government and committee of inquiry after committee of inquiry had without exception decided that the organisation of an independent Ministry and Air Force was best suited to our particular needs.

"This indeed," said Sir Samuel, "is my last word to the House, and it is, perhaps, not the least important of any that I have said. Not only must our programme carry out the principles that I have tried to describe, but it must be so applied as to ensure the closest possible co-operation between all three Services. So far as my advisers and I are concerned, we shall make every effort to ensure this co-operation, and to combine with the keenness of a new Force the fine traditions and varied experience of the two older Services."

#### THE DEBATE

A very lengthy debate followed the introductory remarks of the Air Minister, but did not generally speaking, bring out very much that was new, and it is not therefore proposed in the following report of the debate to do other than touch very briefly upon certain points which have appeared to us to have an important bearing upon the subject of the Air Estimates.

Major Attlee said the most interesting thing in the Air Minister's speech was the revelation which it gave of his outlook and point of view with regard to the whole question of defence. It seemed to him that what the Air Minister really meant by a home defence force was a counter-attacking force of such size as would counterbalance some hostile attacking force, for an air force was not really a defence force at all. He felt himself moved to ask the Government what was the potential menace against which they were arming, and complained that in the Estimates there was no echo of the Locarno spirit. He called attention to the duplication in the Navy, Army, and Air Force Estimates of such services as directorate of operations and intelligence, recruiting staffs, and staff colleges. He did not believe that the expenditure of the three fighting services was worked out on any co-ordinated scheme as to how much should be allocated to each. There ought to be only one staff dealing with these various services for the three forces. What he wanted was one Ministry of Defence and he thought that in Mr. Winston Churchill they had the man for the job, who was accustomed to direct warlike operations in all three elements.

Capt. Guest referred to the attacks made upon the Air Ministry in the press, and would ask those amateur critics whether they had the slightest idea of the number of duties which in the last ten years had been imposed upon and carried out by the small Air Force. Turning to the slowing down of the proposed expansion, he thought that good might come from this period of cessation of intense activity. Unless there was a continuity of policy there was no hope for the solution of the problems. Changing Governments seemed to feel free to alter the main policy, although a policy was

needed which would outlast the precarious life of any one Parliament. He submitted that the body most suitable for the purpose of laying down such a policy was the Committee of Imperial Defence.

Maj.-General Sir Frederick Sykes agreed entirely with the necessity of having the three Estimates in front of them before dealing with one of the Estimates. He also thought it important that the three Service Estimates should be drawn up in a similar form. On the subject of general policy he thought the greatest problem now before the country was that of reduction of armaments with the concomitant problem of imperial foreign policy, and economy in defence. It was imperative that reasoned world opinion should give its verdict upon the whole question of economy. In the meantime he thought the reduction of armaments must be very gradual. He suggested the formation of a joint executive general staff to plan out the parts which Navy, Army, and Air Force should play in Imperial defence. The general staff for imperial defence must have executive power. Turning to the Air Estimates themselves, he disagreed entirely with the policy in force which gave a minute number of skilled men in the air and practically no reserve. The best form of reserve was commercial operations, official and unofficial research, and highly skilled men in factories. It was pleasant to see a welcome light in this regard in the conversion of the Middle East from a military route to a commercial route. Turning to the question of engines, Sir Frederick said that while engine production was the limiting factor in war expansion and skilled labour was the limiting factor in production it was unfortunate that the engine provision had been selected for the largest cut in the Estimates. He wanted one department for the three Services, and would support an amendment to the effect that there should be an inquiry into how best this could be carried into effect.

Rear-Admiral Sueter agreed with nine-tenths of what the Air Minister had said, but thought that delaying the expansion of the Air Service was a retrograde step. He thought the Estimates ought to be kept up to the standard laid down by four consecutive Governments. A great service like the Air Service should have more than one-seventh of the total money provided for the defence of the country. The only way to get the Estimates right was to have a Ministry of Defence. It was bad for the Air Service to have a fluctuating policy, and it was even worse for the industry. Four Governments had promised the industry stability by this expansion, and now they were going to cut down. He thought the industry had been very badly hit. They had had difficulty in getting their nucleus together, and now they were given another slap in the face. He would ask the Under-Secretary to give the industry as much work as he possibly could, and to cut out some of the work at Farnborough and give it to the industry. Turning to another subject, he thought it was most important that they should have more trained and skilled engineers in the Air Force. As regards airships, he suggested that two non-rigid airships of 400,000 cubic feet capacity should be obtained in order to train crews properly.

Colonel Wedgwood wanted to know what steps the Air Minister was taking to bring about the disarmament conference, and to apply it to the air forces throughout the world. He also wanted to know what steps were being taken to see that the development of the air arm was accompanied by a reduction of expenditure on the atrophied branches of the older services.

Lieut.-Col. Spender-Clay agreed with other speakers that it was a pity that the Estimates for the three fighting services could not be presented simultaneously. There was no proper correlation between the three services, and a good deal of blame was, perhaps, due to the Government itself, not only this Government but every Government which had been in power since the Armistice. No Government had laid down a definite policy, and everything had been left to fate. He particularly wanted to focus the attention of the Committee of Imperial Defence on the desirability of merging the Air Ministry within a Ministry of Defence.

Mr. G. Harvey moved that in the opinion of the House either the effective striking strength of the Air Force should be increased or the ground personnel and ministry staff should be reduced. Concerning the spirit of Locarno, to which reference had been made, he thought it evident that the only people who were studying this spirit were the British people. Other people did not seem to be taking the spirit of Locarno as it should be taken. He could not understand why the resources of France, Italy and Great Britain could not be pooled. Both those countries were debtors to Great Britain, and if by pooling, we could be relieved of any portion of the £120,000,000 which the armed forces were going to cost this year, it would be a considerable inducement to us to make some amelioration in the amount of debt they owed



to us. His feeling was that we had not enough pilots or enough machines. It was no good talking about the spirit of Locarno to people who were not willing to listen, unless we were strong and determined enough to force our views upon them.

Sir Frank Nelson seconded the amendment proposed by Mr. Harvey, and rather criticised the expenditure on training establishments, notably Halton. As regards the estimates, he preferred not to vote £16,000,000, but anything the Air Minister liked to put forward, provided we should have the finest Air Force in the world. He was only concerned in seeing that, whether they spent £16,000,000 or £60,000,000, they spent it to the best advantage.

Sir Philip Sassoon, Under-Secretary of State for Air, replied to the proposed amendment. He denied the accuracy of the statement that the proportion of flying personnel to non-flying was disproportionate. We had a higher proportion of qualified pilots available than any other country. A numerous, highly skilled, and well-equipped ground force was essential to maintain an effective fighting force in the air.

Sir Robert Hutchison said the Air Ministry would be well advised to consult with the War Office and the Admiralty to see how far an interchange of officers could take place. It might be that we should arrive at a Ministry of Defence, but he saw no immediate chance of such a change.

Brig.-Gen. Charteris referred to the universal feeling throughout all the Services that sooner or later a Ministry of Defence would be necessary, and said the sooner it came the better for the Services.

Mr. Charleton revived the old suggestion of building aircraft in Government establishments.

Brig.-Gen. Warner considered it a mistake to stop the development of the Home Defence Force, as no practical gesture from any other country in the world had been given. He referred to the orders secured by foreign aircraft firms in the Dominions, and asked whether the Air Minister could not summon a conference of representatives from the various Dominions to discuss the question of aviation and to secure that when they placed their orders those orders should come to this country.

Mr. J. Hudson said the matter to be discussed was an

increase of £500,000 to a net Air Estimate already about £16,000,000. This increase was to be provided under the apparent delusion that it was to secure the defence of the country. They would not secure the defence of the people by spending £16,000,000, or even by spending four times that amount.

Capt. Brass thought the practice of limiting the commissions of young air officers to five years was against the creation of an esprit de corps in the Service.

Lieut. Commander Kenworthy said the Air Minister had departed from the air policy laid down by the Prime Minister in 1923 on account of Locarno. He asked whether other nations had cut down their air force because of Locarno, and answered himself in the negative.

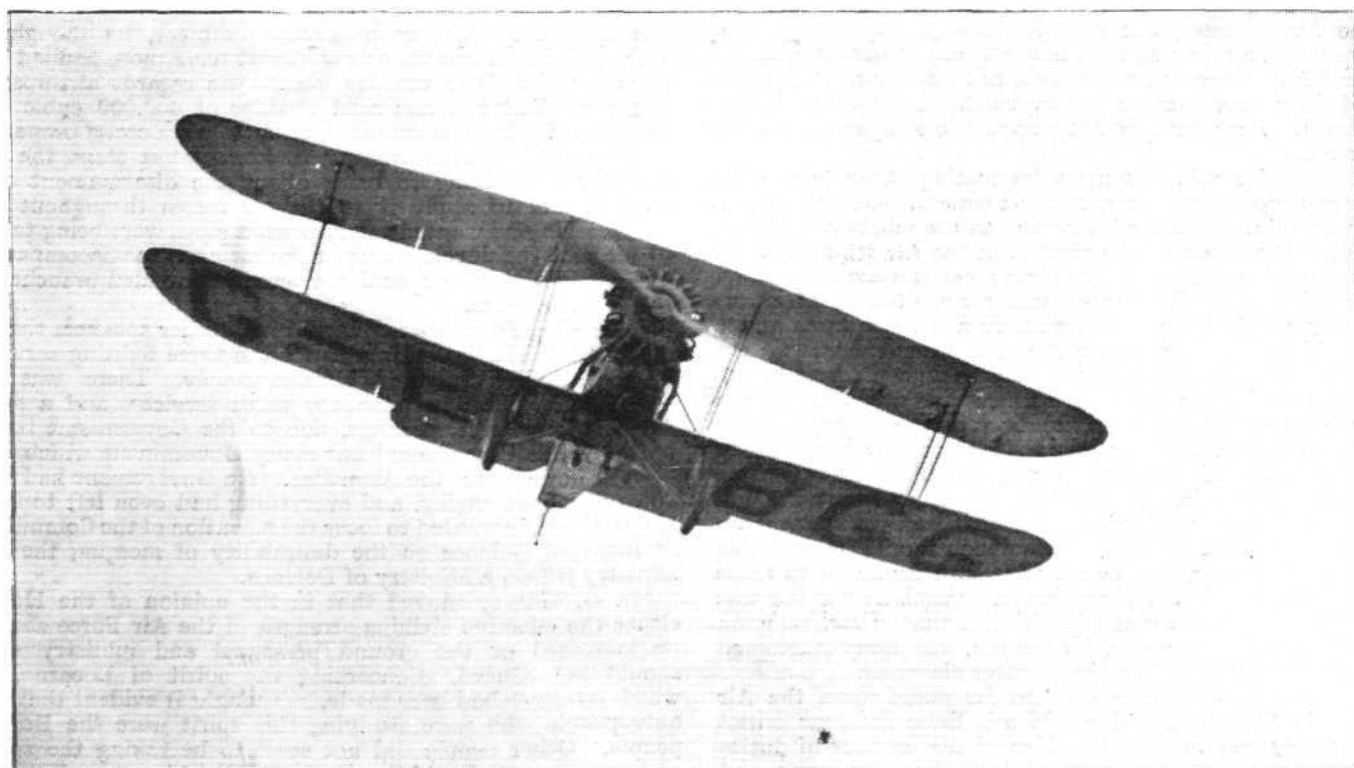
Capt. Reid said that Great Britain as an island would be freed from all hostile attacks by having an adequate and efficient Air Force, even though the Army and Navy were greatly reduced. He looked forward to the time when our Air Force would be increased to double its present strength, and when the Navy and Army would at the same time be decreased in size.

Sir Samuel Hoare, in reply to some of the questions raised, spoke at considerable length, and space does not permit of referring to more than one or two points here. He said it was obvious that there was a growing feeling that there ought to be much closer co-ordination between the three Services, and he believed that every great question of defence and strategy should first of all be considered by the three Chiefs of Staff collectively. He thought it better not to split a comparatively small service like the Air Force up into a number of different sections, and he would much rather try the ideal of spreading engineering knowledge through the whole Service, and try to make all pilots to some extent engineers. The policy of not creating a separate engineering service was showing not unsatisfactory results. They had found that the engineering standard in the Air Force was growing higher every year, and the number of accidents per flying hour was falling year by year. The Imperial Conference would be held next October, and he would bring up the question of air policy then, and would see that air questions had a prominent place on the agenda.

## A Senseless "Stunt"

ARISING, apparently, out of a wager, a young French military pilot, Lieut. Collot, has lost his life in performing a particularly senseless and dangerous "stunt." Flying a Breguet D.14, he left the Orly aerodrome on February 24, and on reaching the Eiffel Tower he dived close to the ground

and flew under the lower platform of the tower. He cleared this safely, but, emerging from the other side, he collided with the wireless aerials, with the result that the machine crashed to the ground and burst into flames. Collot was burnt to death before he could be rescued. Orders have been given that a film taken of this "stunt" is to be destroyed.



**THE BRISTOL "JUPITER" ENDURANCE TEST:** Our photo shows the Bristol "Bloodhound" biplane fitted with a sealed "Jupiter" engine, arriving at Croydon, from Filton, on February 25. Since January 4, when the test started, the machine has been making daily trips between these two points, and no engine replacements have yet been made so far. On Tuesday over 200 hours' flying had been completed and over 22,500 miles flown.



## THE WIRELESS EQUIPMENT OF THE DORNIER-WAL SEAPLANE "NE PLUS ULTRA"

WIRELESS apparatus now forms a very important part of the equipment of aircraft used for combatant services or for commercial purposes, and not the least of the many factors contributing to the successful trans-Atlantic flight of Comandante Franco is the use of the wireless apparatus installed on the Dornier-Wal seaplane—the "Ne Plus Ultra."

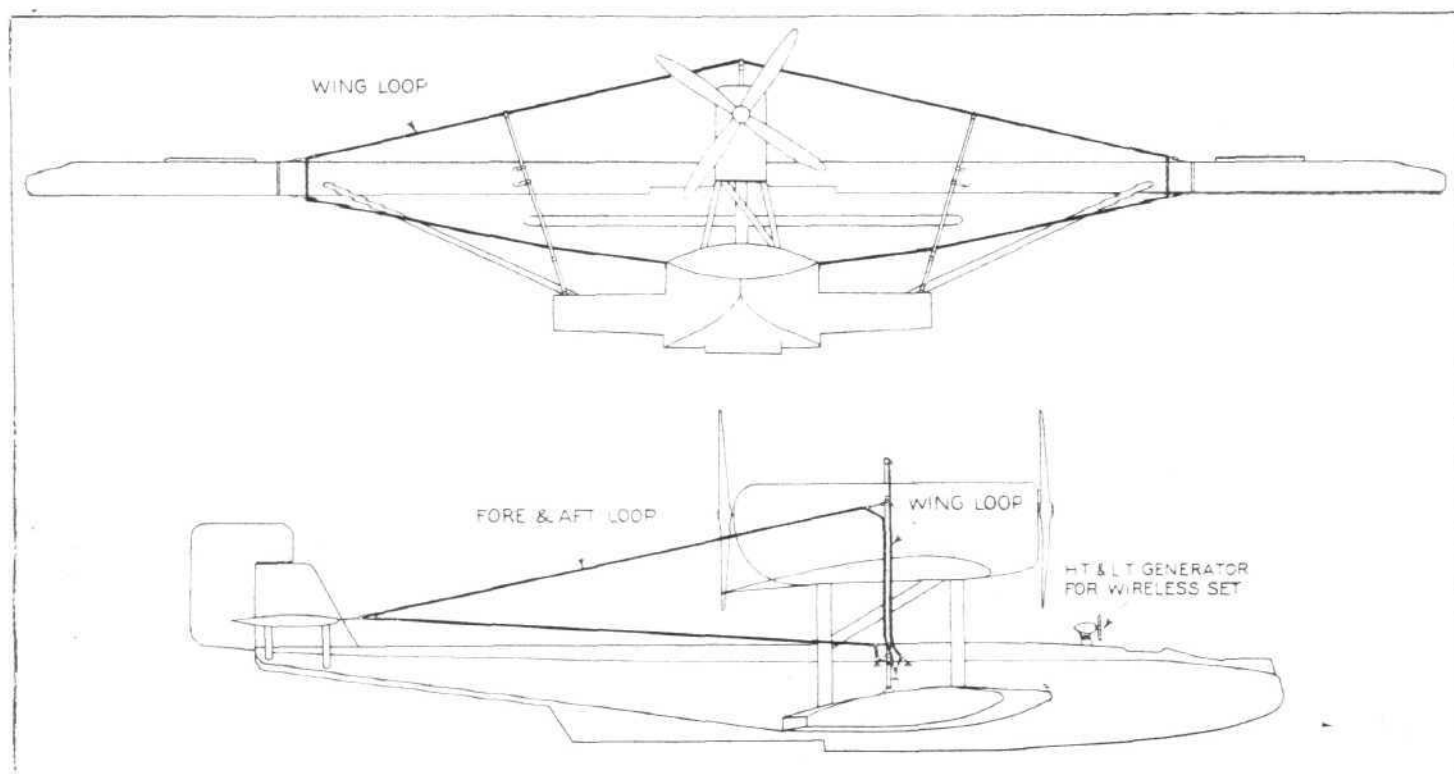
The Dornier-Wal seaplane is mainly constructed of metal, and was equipped with a Marconi standard type A.D.6 telegraph-telephone set and a Marconi direction-finding (D.F.) set.

The metal construction of this machine, while assisting considerably in the reduction of magneto disturbances, adversely effects the receptive power of Bellini-Tosi, or any other loop aerial. In the usual wood and canvas construction no difficulty is presented in installing efficient loop aerals. In all metal machines it is therefore necessary to arrange the D.F. loops as far as possible from closed conducting paths.

was accomplished by the use of a 12-valve amplifier divided into two units. The first unit contains six stages of high-frequency amplification and a detector valve, and the second unit contains an oscillator valve, two stages of intermediate frequency magnification, a detector valve, and a note-magnifying valve. Ten Marconi standard type D.E.V. valves and two standard type D.E.Q. valves, taking a total filament current of 2.4 amperes at 3 volts are used. The anode voltage for the receiver is supplied by a 96-volt dry cell battery, and the filaments are run off an accumulator battery.

The radiogoniometer and high-frequency tuning unit are of the standard type supplied with aircraft equipments, and cover a wave-range of 600-1,000 metres.

The equipment was calibrated on wave-lengths of 600 and 900 metres, and the quadrantal error curves were well within the limits required for navigational purposes.



**WIRELESS AND THE SPANISH TRANSATLANTIC FLIGHT:** The above diagram shows the Marconi Wireless Direction Finding aerial arrangement as fitted on Comandante Franco's Dornier-Wal seaplane.

The limiting factor for reception of the Bellini-Tosi aerial is controlled by the area turns of the fore and aft loops, which should be as great as possible. The area turns, however, are limited by the fact that the loops and the supports must be able to withstand considerable wind pressures, vibrations and shocks, and the difficulty of designing a multi-turn loop supported clear of all masses of metal increases disproportionately with the number of turns. To meet these conditions, therefore, a special type of loop aerial was fitted on the machine, and the Marconi standard aircraft D.F. receiver was altered to increase the working range of the equipment.

The fore and aft loops consist of two single-turn loops supported on struts and arranged symmetrically on each side of the hull, great care being taken to avoid any out-of-balance effects due to the presence of large masses of metal. The two loops are connected in series, and the total area turns is approximately 250 sq. ft. In order to obtain equal reception with the wing coil, a single turn loop is mounted in the plane of the wing. The two sketches show the positions of the two fore and aft loops and the wing loop. The terminal ends of the loops are connected by a length of cable leading to the navigator's position near the pilot.

To increase the working range of the direction finder and to compensate for the smaller receptive power of the loops, it was found necessary to increase the overall magnification of the standard aircraft direction finder receiver. This

### Results with D.F. Apparatus

Reports from Captain Ruis de Alda, the navigator who took the D.F. bearings during the flight, show that bearings were obtained at a distance of 700 kms. (434 miles) from Las Palmas, and such was the accuracy of the readings that the course was directed solely by the aid of the direction finder during this stage of the flight. When nearing Las Palmas visibility was very poor, but the signals from the shore stations enabled the navigator to maintain a direct course to his destination. The reader will, no doubt, be interested in the following extracts of a letter sent by the navigator, Captain J. Ruis de Alda, from Las Palmas to the Chief Engineer of La Compania Nacional de Telegrafia sin Hilos, Spain:—

January 25, 1926.

"At 50 kms. from the Spanish coast began the clouds which were at 200 m. over sea, and extended to Canary Islands. Therefore, in the case of flying below the clouds layer, we would not be able to do astronomical observations, and over the layer we would not see our deviations produced by the wind.

"Since the first bearing obtained, which gave Las Palmas at 7° starboard until the end of the flight, its work was mathematic; it was giving us the difference in angles of Las Palmas and Tenerife. Briefly, since 11 a.m. we were directed solely by the D.F. I marked on the chart, obtaining them by the intersection of the two

bearings, several points, and none was separated more than 5 miles from the ideal route.

"As we were approaching we heard all steamers in the vicinity of the islands, and all of them gave me a unique bearing as a whole, as the steamers were scattered around the islands. At 3 p.m. we perceived indistinctly a very far island on the port side, and Franco decided to make for it. I told him that the island in question was Lanzarote, and as he apparently was not convinced, I gave him the bearings obtained with the D.F., and they were giving mathematically the degrees we separated from our route. Then Franco, convinced, returned to the route, and we continued without seeing land until after 10 kms., when we saw close to us an island. We passed through a glade and the Puerto de la Luz (Las Palmas) was at sight. We landed, and remain here on account of the heavy sea, which does not allow us to leave, although I hope we shall proceed the flight to-morrow."

As regards the telegraph-telephone equipment, the standard type A.D.6 set was used for the transmission and reception of ordinary service messages. The essential components of both transmitter and receiver are mounted in one unit.

The transmitting system comprises an aerial tuning inductance, an oscillation valve, control valve, and a sub-control valve. The receiving system comprises an aerial tuning inductance and a five-valve amplifying detector.

The valves used on the transmitter are two Marconi standard type M.T.3F and one M.T.5 with a total filament current of 6.6 amperes at 6 volts. The receiving valves are two type V.24 and three type QX, with a total filament current of 3.75 amperes at 5 volts.

The wave-range of the transmitter and receiver is continuously variable between 400 and 1,200 m.

The system of remote control by means of Bowden cable enabled the operator to change over the send-receive switch, or to effect small adjustments in the tuning of the circuits.

A dual control equipment, comprising two microphones, two pairs of headphones, and two coupling units, enabled either the pilot or navigator to use the wireless set or to converse with each other.

Power for the anode circuits of the valves and for the filament lighting batteries was supplied by a wind-driven generator developing 100 milliamps. at 1,500 volts and 6 amperes at 7 volts. A trailing aerial approximately 200 ft. long was used for the set.

## THREE BRITISH LONG-DISTANCE FLIGHTS

THERE are three big flights by British pilots, on British machines, now in progress:—Alan Cobham's dash home from Cape Town, the R.A.F. Cairo-Cape Town quartette, and another "dash home" from Karachi, which is being attempted by two R.A.F. officers, Flight-Lieut. Oliver and Flying Officer Brooke, on leave.

As previously announced in FLIGHT, Alan Cobham, having taken some time to accomplish the outward journey from London to the Cape (in order to make a thorough survey of the route), is hoping to get the best out of the D.H. 50J—Siddeley "Jaguar" combination on the home journey, and cover the 8,000-odd miles in something like record time. Up to the present he has been making excellent progress, except for a day's delay owing to tropical rains. Cobham, with A. B. Elliott (Engineer) and B. W. G. Emmott (Cinematographer), started off from Cape Town on February 26 and flew 300 miles to Beaufort West in 3 hrs. 2 mins. Proceeding after a short stop, he reached Kimberley after another 6½ hours' flying. Early next morning the 500-mile stage to Palapye Road was accomplished in 4 hrs. 55 mins., and after a rest of about an hour the flight was continued to Bulawayo. During this trip Cobham had to dodge numerous tropical storms, and only just managed to reach Bulawayo before a particularly violent storm burst.

The next day they started off at 7.30 a.m. and reached

Broken Hill (530 miles) in 4 hrs. 50 mins. In the afternoon they continued on to N'dola, another 110 miles. They were unable to leave N'dola on March 1 as planned owing to the sodden state of the aerodrome, caused by the heavy rains, so about a thousand natives set to work stamping the ground down to a suitable hardness for taking off the next day.

As regards the R.A.F. flight—which follows much the same route as that taken by Cobham—this started on March 1, when four Fairey III D's (Napier "Lions") fitted with wheels left Heliopolis under the command of Wing-Commander C. Pulford, O.B.E., A.F.C. The other members of the expedition include Flight-Lieuts. L. E. M. Gilman, E. J. H. Hope and P. H. Mackworth, Flying Officers Jones and Payne, and Sergeants Hartley and Gardener. Making a stop at Assiut, the four machines flew to Assuan, where, unfortunately, one machine met with a slight mishap, losing a wheel on landing.

Flight-Lieut. Oliver and Flying Officer Brooke, who are making a sporting, and unaided officially, attempt to fly from Karachi to London in five days, left Karachi, in a D.H.9 (Siddeley "Puma") on March 1, and hoped to reach Bushire that evening. Lieut. Oliver, however, was forced to descend at Pasni, about 250 miles from Karachi, and a fierce sandstorm prevented a resumption of the flight until early next morning.

## ROYAL AERONAUTICAL SOCIETY



The annual general meeting of the Royal Aeronautical Society will be held on March 25, at 5 p.m., at the offices of the Society, 7, Albemarle Street, London, W. 1.

Agenda.—(i) To approve the report of the Council on the state of the Society, and the balance-sheet of Aerial Science, Ltd., as printed in the *Journal of the Royal Aeronautical Society* for March, 1926.

(ii) To discuss and determine such questions as may be proposed by the voters relating to the affairs of the Society, and to fill the vacancies on the Council for the ensuing year. Any voter desirous of proposing any subject for discussion at the annual general meeting shall give notice in writing to the Secretary, which shall be received by him not later than noon on March 17.

(iii) To consider the addition of the following to the rules:—"A postal vote may be ordered by the Council on any question affecting the welfare of the Society."

The retiring members of Council are: Sir W. S. Brancker, K.C.B., A.F.C., F.R.Ae.S.; Mr. G. Brewer, F.R.Ae.S.; Prof. C. F. Jenkin, C.B.E., M.Inst.C.E., F.R.Ae.S.; Maj. A. R. Low, F.R.Ae.S.; Mr. W. O. Manning, F.R.Ae.S.; Mr. J. D. North, F.R.Ae.S.; Lieut.-Col. A. Ogilvie, C.B.E., F.R.Ae.S.; Sir W. N. Shaw, F.R.S., F.R.Ae.S.; Mr. H. E. Wimperis, O.B.E., F.R.Ae.S.; Mr. R. McK. Wood, F.R.Ae.S., who are eligible for re-election.

Nominations of candidates for election to the Council shall be signed by the voters proposing them (two voters and no more), and must be received by the Secretary by noon on March 6, with an intimation in writing by the voters nominated that they are willing to serve.

Will members please note that Capt. G. T. R. Hill's paper on "The Tailless Aeroplane" has been postponed from April 15 to April 22, and will be delivered at the Royal Society of Arts.

J. LAURENCE PRITCHARD,  
Honorary Secretary.

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### Polar Airship's Trial Flight

THE Italian semi-rigid airship NR.1, on which Capt. Amundsen will attempt another flight to the North Pole this year, has been modified to meet the special requirements for the expedition, and on February 27 it made a successful trial flight from Rome to Naples and back. It was in the air for about eight hours and there were 30 persons on board, including Rüser-Larsen and other members of the Polar expedition. Successful tests have also been made in mooring the airship to a mast.

### British Rigid Airship R.101

THE work of building the new 5,000,000 cubic ft. airship R.101 (this is the civilian or "Burney" airship), which will be employed on the service to India, will start in the first week in April at Howden, Yorks.



# THE ROYAL AIR FORCE

London Gazette, February 23, 1926.

## General Duties Branch

The following Flying Officers are granted permanent commissions in this rank (Jan. 1):—F. Kirk, G. V. Wheatley. Pilot Officer on probation F. C. Rowland is confirmed in rank (Feb. 5).

The following Flying Officers are transferred to the Reserve, Class A:—L. H. Ridley (Feb. 25); W. J. Walsh (Feb. 26).

Flying Officer J. Durward is transferred to the Reserve, Class B, in that rank and is granted permission to retain rank of Flight Lieut. (Dec. 7, 1925). (Substituted for Gazette, Dec. 8, 1925.) Squadron Leader A. W. C. V. Parr is placed on retired list at his own request (Feb. 24); Pilot Officer G. D. Venables relinquishes his short service commission on account of ill-health (Feb. 24); Pilot Officer W. E. Nicholls resigns his short service commission (Feb. 24); the short service commission of Pilot Officer on probation G. S. J. Bowman is terminated on cessation of duty (Feb. 5).

Flying Officer L. A. L. Firmin (Lieut., 4th Bn. The Buffs, T.A.) is dismissed the service by sentence of General Court-Martial (Feb. 11).

## Stores Branch

The following Flying Officers are granted permanent commissions in this rank (Feb. 24):—E. G. Keeping, A. J. Redman, D.F.C., D. A. W. Sugden, H. E. Young. The following Flying Officers are confirmed in their appointments in the Stores Branch and are granted permanent commissions in this rank (Feb. 24):—F. H. Bedford, M.C., M.M., R. M. Taylor, M.C.

## Medical Branch

Flying Officer R. H. Stanbridge is promoted to rank of Flight Lieut. (Feb. 19); Flight Lieut. H. E. Flavell (Capt., Army Dental Corps), relinquishes his temp. commission on return to Army duty (Jan. 29).

## Reserve of Air Force Officers

E. R. Meads is granted a commission in Class A.A., General Duties Branch, as a Pilot Officer on probation (Feb. 8).

## ROYAL AIR FORCE INTELLIGENCE

**Appointments.**—The following appointments in the Royal Air Force are notified:—

### General Duties Branch

Group Captain R. C. M. Pink, C.B.E., to H.Q., Air Defences of Great Britain, for Air Staff duties; 6.3.26.

Air Commodore C. L. N. Newall, C.M.G., C.B.E., A.M., to R.A.F. Depot Supernumerary, pending posting to the Air Ministry; 1.3.26.

**Squadron-Leaders:** H. A. Tweedie, O.B.E., A.F.C., to No. 2 Armoured Car Co., Palestine; 13.2.26. J. H. Simpson, to Air Ministry; 1.3.26. A. J. Butler, O.B.E., M.C., A.F.C., to No. 4 Flying Training Sch., Egypt; 10.2.26. R. Graham, D.S.O., D.S.C., D.F.C., to R.A.F. Staff Coll., Andover; 1.3.26. B. E. Baker, D.S.O., M.C., A.F.C., to Experimental Section R.A.E., S. Farnborough; 1.3.26.

**Flight-Lieutenants:** J. R. I. Scambler, A.F.C., to No. 2 Wing H.Q., India; 10.1.26. H. W. Clayton, to No. 14 Sqn., Palestine; 29.1.26. E. B. Grenfell, A.F.C., to Station H.Q., Northolt; 16.2.26. W. B. Everton, to Inland Area Aircraft Depot, Henlow; 11.3.26. E. F. Waring, D.F.C., to Air Ministry; 15.3.26. G. L. Ormerod, to Station H.Q., Duxford; 16.2.26. C. D. Palmer, to No. 2 Group H.Q., Spittlegate; 26.2.26.

**Flying Officers:** F. H. Astle, to Station H.Q., Spittlegate; 22.2.26. B. Cheesman, M.B.E. to Engine Repair Depot, Egypt; 6.2.26. A. L. Pearce, to R.A.F. Depot, on transfer to Home Estab.; 12.1.26. H. Ford, D.F.C., to R.A.F. Depot; 9.2.26. C. G. Hancock, to R.A.F. Base, Gosport; 26.2.26. S. C. Black, M.M., to No. 84 Sqn., Iraq; 12.2.26. R. B. Jordan, to No. 31 Sqn., India; 12.2.26. J. J. Nolan, to No. 6 Sqn., Iraq; 12.2.26. R. Melbourne, to No. 8 Sqn., Iraq; 12.2.26. G. W. R. Russell, to No. 20 Sqn., India; 12.2.26. W. R. Heywood, to Sch. of Naval Co-operation, Lee-on-Solent; 19.2.26. T. H. J. Wright, to No. 2 Sqn., Manston; 15.2.26. W. H. O. Rumfitt, to No. 7 Sqn., Bircham Newton; 15.2.26. M. Kortright, to No. 13 Sqn., Andover; 15.2.26. H. M. Whittle, to No. 502 Ulster Sqn., Aldergrove; 15.2.26.

**Flying Officers:** C. S. Whellock, to H.Q., Palestine; 1. A. Lees, to No. 2 Armoured Car Co., Palestine; 29.1.26. C. H. Jennings-Brandy, to No. 4 Armoured Car Co., Iraq; 1.2.26. C. Ayling, to No. 23 Sqn., Henlow; 8.3.26. H. Little, to Sch. of Tech. Training (Men), Manston; 19.2.26. J. W. Bell, D.S.M., to R.A.F. Depot; 1.3.26. S. J. Stocks, to remain at No. 7 Sqn., instead of to Night Flying Flight, as previously notified. R. W. E. Bryant, to No. 111 Sqn., Duxford; 19.2.26. A. E. Golds, to Night Flying

Flight, Biggin Hill; 14.2.26. A. E. Thompson, to R.A.F. Depot, on transfer to Home Estab.; 29.1.26. F. C. Marsh, to No. 20 Sqn., India; 20.2.26.

**Pilot Officers:** E. B. C. Groner, to Aircraft Depot, Iraq; 12.2.26. W. F. Rimmer, to No. 55 Sqn., Iraq; 12.2.26. B. A. C. Danbury, to No. 8 Sqn., Iraq; 12.2.26. B. W. Knox, to No. 30 Sqn., Iraq; 12.2.26. E. L. S. Ward, to Aircraft Depot, India; 12.2.26. C. J. Pavia, to No. 502 Ulster Sqn., Aldergrove; 15.2.26. J. H. Barringer and C. Heard-White, to No. 207 Sqn., Eastchurch; 15.2.26. J. S. Blomfield, F. Sisson and C. J. Veevers, to No. 2 Sqn., Manston; 15.2.26. D. W. Gibbon, to No. 9 Sqn., Manston; 15.2.26. V. T. Norwood, to No. 13 Sqn., Andover; 15.2.26. A. L. R. Page, L. T. Pankhurst, S. C. Parker, E. G. H. Russell-Stracey and W. R. J. Spittle, to No. 16 Sqn., Old Sarum; 15.2.26. P. B. Tomkins, to No. 39 Sqn., Spittlegate; 15.2.26. P. V. Williams, to No. 7 Sqn., Bircham Newton; 15.2.26. S. B. Flood, to No. 2 Flying Training Sch., Digby, on transfer to Home Estab.; 22.1.26.

**Pilot Officers:** P. H. Nicholls, to No. 20 Sqn., India, instead of to Aircraft Depot, as previously notified; 15.12.25. H. A. Evans-Evans, to No. 14 Sqn., Palestine; 29.1.26. L. Dalton-Morris, to Night Flying Flight, Biggin Hill; 24.2.26. J. C. Noel, to No. 111 Sqn., Duxford; 19.2.26. K. C. Baker, to Heliopolis Details, Egypt; 9.2.26. V. J. Sofiano, to No. 216 Sqn., Egypt; 10.2.26.

## Stores Branch

**Squadron Leaders:** V. J. B. Jacobs, to H.Q., Egypt; 13.2.26. W. Millett, to Air Ministry; 13.2.26.

**Flight Lieutenant:** D. Mitchell, to Stores Depot, Iraq; 27.1.26.

**Flying Officers:** A. McC. Goddard, to Aircraft Depot, Iraq; 27.1.26. P. H. Wynne-Burt, to H.Q., Iraq; 12.2.26. J. G. Smithson, to No. 13 Store Depot, Milton; 9.2.26. P. Alderson, to remain at No. 1 Stores Depot, Kidbrooke, instead of to No. 2 Flying Training Sch., as previously notified.

## Accounting Branch

**Squadron Leader:** H. F. Fuller, to R.A.F. Depot; 1.3.26.

**Flying Officer:** R. W. L. Glenn, to No. 84 Sqn., Iraq; 12.2.26.

## Medical Branch

**Flying Officers:** A. A. Townsend, M.B., to R.A.F. Depot, on transfer to Home Estab.; 12.1.26. G. M. Anderson, M.B., to No. 58 Sqn., Worthy Down; 4.2.26. E. J. Jenkins, to R.A.F. Depot; 22.2.26.

## IN PARLIAMENT

### Air Services

SIR H. BRITAIN, on February 18, asked the Secretary of State for Air whether any suggestion has been made to his Department for a seaplane service between Southampton and Cherbourg, or between any British port and a similar terminus in France?

SIR S. HOARE: I know of no recent suggestion for such a service. When the existing Southampton-Guernsey service was first proposed the possibility of operating a service also to Cherbourg was considered, but Imperial Airways, Ltd., who would naturally undertake the further service, are confining themselves for the present to the line to Guernsey.

### R.A.F. Aircraft and Engines

SIR F. SYKES, on February 22, asked the Secretary of State for Air (1) the numbers or proportions of aircraft on the Royal Air Force charge of which the designs were first produced prior to the war, during the war, and since the war, respectively; (2) the numbers or proportions of aero-engines on charge of the Royal Air Force of which the designs were first produced prior to the war, during the war and since the war respectively?

SIR S. HOARE: The strength of the Royal Air Force at the present time is approximately the equivalent of 56 regular squadrons. Of these 28 are equipped with aircraft and engines of post-war design, and two others are now in course of being so equipped. The remaining squadrons are equipped with aircraft and engines of types designed during the war, there being to-day no service aircraft of pre-war design in use. It would not be in the public interest to give more detailed information.

SIR F. SYKES asked the Under-Secretary of State for India (1) the numbers or proportions of aero-engines on charge of the Indian Government of which the original designs were first produced prior to the war, during the war, and since the war respectively; (2) the numbers or proportions of military aircraft on charge of the Indian Government of which the original designs were first produced prior to the war, during the war, and since the war respectively?

SIR S. HOARE: I have been asked to reply. All Royal Air Force squadrons in India at the present time are equipped with aircraft and engines of types designed during the war.

### Ammunition and Explosives Inspection

SIR F. SYKES asked the Secretary of State for Air the numbers and cost of staff employed on the inspection of ammunition and explosives; and what work of this nature, if any, is carried out by the Air Ministry for the other Service Departments?

SIR S. HOARE: As regards the first part of the question, the number and cost of the staff at present employed by the Air Ministry for the purpose referred to are 18 and £3,500 respectively. As regards the second part, no inspection for the other Service Departments is carried out by the Air Ministry.

### Air Navigation (Consolidation) Order

CAPTAIN W. SHAW asked what restrictions, if any, are in force against aeroplanes that are merely out for pleasure flying over towns and cities, and for which no Government purpose is served?

SIR S. HOARE: Article 9 of the Air Navigation (Consolidation) Order, 1923, includes a prohibition, contravention of which is punishable by imprisonment or fine or both on summary conviction, of aircraft flights over any city or town except at such an altitude that the aircraft should be able to land outside the city or town if its means of propulsion were to fail. It also prohibits trick flying or exhibition flying over any city or town area or populous district, and any flying which by reason of low altitude or proximity to persons or dwellings or for any other reason is the cause of unnecessary danger to any person or property on land or water.

### Headquarter Staff, Halton

BRIGADIER-GENERAL CHARTERIS, on February 24, asked the Secretary of State for Air what is the number of commissioned officers employed on administrative duties, as apart from technical instructional duties, on the headquarter staff at Halton?

SIR S. HOARE: The answer is 37 officers, this number being exclusive of a few officers temporarily borne as supernumerary to establishment, and also of four chaplains. Of the 37 officers in question, 13 are in command and general charge of the 2,000 aircraft apprentices, and 14 are employed on pay, store, supply and accounting duties.

### Cranwell Cadet Training Cost

MR. MERRIMAN asked why the estimated gross cost of the education of a cadet at Cranwell for the current financial year is £615, as compared with the corresponding figure of £391 for Sandhurst?

SIR S. HOARE: The chief reason for the difference is that, while there are over 500 cadets at Sandhurst, there are under 100 at Cranwell, and the distribution of the standing and overhead charges over a smaller number naturally results in a higher per capita cost. Furthermore, the Cranwell cadets receive a higher rate of pay than those at Sandhurst, and the cost of workshop training for them, which comes to over £7,000 a year, is considerably higher. The costing figure of £615 is based on past expenditure. There have recently been reductions in the Cranwell establishment, and the figure will probably be less in the coming year. I may add that in view of the technical instruction given at the Royal Military Academy at Woolwich, this Army Establishment is much more nearly comparable to Cranwell than is Sandhurst. The cost per cadet at Woolwich is £524 per annum, and the difference between this figure and the £615 per cadet for Cranwell is principally due to the fact that the number of cadets at the Royal Military Academy is more than double that at the Royal Air Force Cadet College.

Colonel Woodcock: Does that £615 include the cost of instruction in flying?

SIR S. HOARE: No.



# SOCIETY OF MODEL AERONAUTICAL ENGINEERS

THE annual general meeting of the Society took place at Headquarters on Tuesday, February 9, M. A. F. Houlberg occupying the Chair. A review of the year showed steady progress within the Club, and there was distinct evidence that this progress was likely to continue throughout the coming year.

The officers for the ensuing year were elected as follows:—

President, Dr. A. P. Thurston.

Chairman, F. de P. Green.

Treasurer, W. E. Evans.

Secretary, B. K. Johnson.

Competition Secretary, R. Langley.

Technical Secretary, R. N. Bullock.

The 1926 flying programme was approved, and the accompanying table gives the dates of the forthcoming competitions:

Date.	Place.	Cup.	Competition.
April 10 .. ..	Ground to be decided later .. ..	—	Speed trial day.
April 24 .. ..	Sudbury .. ..	Weston Cup .. ..	For fuselage gliders.
May 8 .. ..	Wimbledon .. ..	K. & M.A.A. Cup .. ..	Freshman's Competition (any type).
May 22 .. ..	Sudbury .. ..	Pilcher Cup .. ..	Distance fuselage models.
June 5 .. ..	Wimbledon .. ..	Model Engineer No. 1 Cup .. ..	Duration fuselage models (R.O.G.).
June 19 .. ..	Ground to be decided .. ..	—	For "Wing only" type of model.
July 3 .. ..	Welsh Harp .. ..	Gamage Cup .. ..	Competition for Novices (any type).
July 17 .. ..	Sudbury .. ..	Sir John Shelley Cup .. ..	Any type of model.
July 24 .. ..	Welsh Harp .. ..	S.M.A.E. Cup .. ..	Power-driven fuselage models.
September 11 .. ..	Sudbury .. ..	Lady Shelley Cup .. ..	Competition for fuselage speed models.
		FLIGHT Cup .. ..	Fuselage seaplanes.
		M.E. No. 2 Cup .. ..	Auto-giro models.
		—	Seaplane record day.
		—	Farman models (type O—1—P—1).
		—	Glider record day.

## AIR MINISTRY NOTICES

### Examination for Aerial Navigators

An examination for 1st and 2nd Class Aerial Navigators' licences will be held at the Air Ministry, Gwydyr House, Whitehall, on Monday and Tuesday, April 12 and 13, 1926.

The syllabi and conditions of examination may be obtained on application to the Secretary, Air Ministry (A. & L.), Gwydyr House, Whitehall, London, S.W.1.

Applications to sit at this examination should be received at the above address not later than April 6, 1926. Candidates should give with their applications full details of any qualifications and experience they already possess.

No. 3 of 1926.

### Third Annual R.A.F. (India) Reunion Dinner

THE annual R.A.F. (India) Reunion Dinner for officers who have served with the R.A.F. in India, will be held this year at the Savoy Hotel at 7.30 p.m. (for 8 p.m.) on Saturday, March 27 (the day of the R.A.F. v. Army Rugby football match at Twickenham). Tickets, 16s. 6d. (exclusive of wines). Evening dress and miniatures to be worn. It is requested that applications for tickets be made as early as possible, accompanied by remittances, to Flight-Lieut. C. A. Elliott, R.A.F. Station, South Farnborough, Hants, from whom full details can be obtained.

### Three Years' Civil Flying in Australia

ON November 2 last the Queensland and Northern Territory Aerial Services, Ltd. (Q.U.A.N.T.A.S.), which company operates the aerial passenger and mail service between Charleville and Camooweal (825 miles), entered into its fourth year of activity. During this three years of office the "QUANTAS" have established an excellent record, as follows:—

Total mileage flown .. ..	303,477.
All-round efficiency .. ..	100 per cent.
Injury to passengers or personnel .. ..	Nil.
Surcharge letters carried .. ..	42,557.
Paying passengers .. ..	2,112.
Freight (excluding passengers' luggage) .. ..	20,452 lbs.
Total hours flown .. ..	2,620.

These figures (for which we are indebted to Shell-Mex, Ltd., who supply the "moving spirit of the undertaking") do not include taxi-flights off the mail route, some of which exceed 1,000 miles in length. The general increase in 1925 performance over that of 1924 was as follows:—Route passengers, 72 per cent.; taxi passengers, 86 per cent.; mails, 100 per cent.; freights, 130 per cent.

The introduction of a Club Journal by Mr. W. E. Evans was greatly appreciated; this periodical will undoubtedly provide a means of keeping all members in closer touch with the work carried out by the Society.

Five new members were elected at the meeting.

Two new forms of competition were inaugurated for the coming flying season; viz.

1. Auto-giro competition (proposed by Dr. A. P. Thurston).

2. Speed competition (proposed by Mr. R. N. Bullock).

The rules for these will appear at a later date.

The Secretary will be pleased to receive any enquiries re the Society. Communications should be addressed to 58, Norton Road, Wembley.

B. K. JOHNSON,

Secretary, S.M.A.E.

## PUBLICATIONS RECEIVED

*The Canadian Patent Office Record.* Vol. LIV. Nos. 5 and 6. February 2 and 9, 1926. Canadian Patent Office, Ottawa, Canada. Price 25 cents.

*Luftbarrikaden.* By Fischer von Poturzyn. Adolf Spohnholtz Verlag (G.M.B.H.), Hanover, Germany.

*Official Gazette of the U.S. Patent Office.* February 2, 1926. Vol. 343. No. 1. United States Patent Office, Washington, D.C., U.S.A.

*Aeronautical Research Committee Reports and Memoranda:* No. 982 (M. 30). *High Frequency Fatigue Tests.* By Prof. C. F. Jenkin. H.M. Stationery Office, Kingsway, London, W.C.2. Price 9d. net.

*Sprazzi e Baliori.* Vol. 3, No. 1. January 15, 1926. Magneti Marelli, Sesto S. Giovanni, Milan, Italy.

## AERONAUTICAL PATENT SPECIFICATIONS

Abbreviations: Cyl. = cylinder; i.c. = internal combustion; m. = motor. The numbers in brackets are those under which the Specifications will be printed and abridged, etc.

### APPLIED FOR IN 1925

Published March 4, 1926

4,089.	J. ORLAY.	Airships. (242,934.)
4,478.	A. LEPINTE.	Safety devices for aeroplanes. (229,670.)
6,813.	H. JUNKERS.	Flying-machines. (231,846.)
13,053.	J. M. RUSSELL.	Parachutes. (234,141.)
14,826.	G. M. BALL.	Body harness for aviators. (247,062.)
18,720.	J. W. BOWERBANK.	Radiators. (247,086.)

## FLIGHT

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